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Arvid Aschan

Abstract

The demand for organic products has been substantially increasing, which has been noted by Lantmännen, one of Northern Europe´s largest agricultural cooperative. With the increasing demand for organic products, Lantmännen has set a goal of doubling its trade in organic grain by year 2020. The increased demand for organic products is also noticeable on the supply side; Swedish organic arable land has almost doubled during the last decade. In addition to its trade in organic grain, Lantmännen also markets organic-approved products to increase the yield of organic grains; and increased yields is perceived to be an important aspect in realizing the mission for 2020.

One of the most important product Lantmännen offers for increasing organic grain yield is Biofer, an organic fertilizer from Gyllebo Gödning. The trade of Biofer has, despite the increased demand for organic products, been relatively stable during the same period. The aim in this study is to find out why the trade of Biofer does not correspond to the increased use of land for organic farming. To find the answer, the researcher has completed an empirical study based on interviews with organic farmers to learn about their decision making concerning the use of purchased fertilizers on their farms.

It was found from the empirical study that the economy of the individual farmer was the most determining factor, which also affects all buy phases in the famers' decision-making process. However, there were some economic factors of the buying decision process that neither the farmers nor the researcher could verify. Those factors included: current competition, product substitutes and cereal prices.

After analysing the three factors the researcher concludes that cereal prices don´t have any connection to traded volumes of Biofer. Consequently, the product substitute manure and the competitor Ekoväx are the two factors that are perceived to affect the buying decision. Biofer is an added source of nutrients and is not included in the organic cycle in the same way as organic manure and therefore entails a higher cost. These are the reasons why it´s hard for Biofer to increase on the market and compete with manure in organic fertilizing. The competitor Ekoväx affects the farmers´ buying decision since the company competes for the same market shares and consequently, the same customers- the organic farmers.

Sammanfattning

Efterfrågan på ekologiska produkter ökar kontinuerligt, något som inte minst märks av hos Lantmännen. Lantmännen är norra Europas största lantbrukskooperativ inom lantbruk, maskin, bioenergi och livsmedel. Lantmännen har agerat efter den ökade ekologiska efterfrågan med målsättningen att dubblera handeln med ekologiskt spannmål till år 2020. Den ökade efterfrågan märks också av på utbudssidan då den svenska ekoarealen dubblerats det senaste decenniet. Lantmännen tillhandahåller ekologiska produkter för att kunna öka avkastningen på ekologisk spannmål. Insatsvarorna utgör en central roll i arbetet för att nå målsättningen år 2020.

En av de viktigaste ekologiska insatsvaror som Lantmännen erbjuder för ökad avkastning är ekogödseln Biofer från Gyllebo Gödning. Handeln av ekogödsel har varit relativt konstant det senaste decenniet. Målet med denna studie är att ta reda på varför handeln av ekogödsel inte korresponderar i högre grad med övrig efterfråga av ekoprodukter. Forskaren har sökt svaret genom en empirisk studie av fyra stycken ekologiska bönder med fokus på köpbeslut.

Resultatet från den empiriska studien visar att ekonomiska faktorer påverkar böndernas köpbeslut inom samtliga köpfaser, vilket indikerar att det är den viktigaste påverkande faktorn huruvida bönder köper ekogödsel eller inte. Den studerade köpprocessen innehöll faktorer som varken bönderna eller forskaren vid första anblick kunde kvantifiera. Dessa faktorer bestod av nuvarande konkurrens, substitutvaror och spannmålspriserna.

I Analysen reder forskaren ut de tre faktorerna, vilket leder till slutsatsen att spannmålspriserna inte har något samband med handlade volymer av Biofer. Substitutvaran stallgödsel och konkurrenten Ekoväx är däremot faktorer som påverkar böndernas köpbeslut. Biofer ingår inte i det ekologiska kretsloppet på samma sätt som stallgödsel och utgör även en högre kostnad än stallgödsel. Biofer har därmed svårt att konkurrera med stallgödsel, vilket är orsaken till att Biofer har svårigheter att öka försäljningen. Ekoväx påverkar köpbeslutet eftersom de konkurrerar om marknadsandelar och följaktligen om lantbrukarna.

Translations, explanations and abbreviations

Biofer – Brand name of Gyllebo Gödning´s organic fertilizers.

Ekoväx – Company in Sweden that manufactures and sells organic fertilizers.

Gyllebo Gödning - Gyllebo Gödning is the market leader in Sweden of organic fertilizers that mainly manufactures certified fertilizers for organic farming with the brand name Biofer.

Jorbruksverket - The Board of Agriculture is the Government's expert authority in matters of agri-food policy, and is responsible for the agricultural and horticultural sectors.

Lantmännen - Lantmännen is northern Europe’s leading agricultural cooperative considering the four divisions; agriculture, machinery, bioenergy and food products.

NPK – Shortening of nitrogen (N), phosphorus (P) and potassium (K).

Östergötland – Province in the south of Sweden.

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1 Introduction

In this chapter, the problem background is presented in order to understand the problem and to introduce the study. Thereafter, the problem generates the aim of the study, which is reached by answering the research question. Finally, the delimitations are presented and discussed, explaining which parts of the research field that the research question does not intend to answer.

1.1 Problem background

In the beginning of the 1900s, fertilizers were developed by transforming nitrogen- and hydrogen gas to ammonia, a process known as the Haber-Bosch-Process (Kandemir *et al*., 2013). Several years later, researchers were starting to criticize the fertilizers and one of the pioneers was Rudolf Steiner, the originator of biodynamic farming. The critics claimed fertilizers had negative impact on the environment and organisms. Steiner advocated that fertilizers should be excluded from agriculture and replaced by natural resources. Today Steiner's philosophy is one of the main aspects of organic agriculture (Videgård, 1991).

The purpose of today's organic farming is to use natural resources in a long-term sustainable way. Farmers try to live up to this purpose through treating the environment with respect to the natural habitat of animals and plants. This philosophy is taken into consideration when it comes to promoting animal health, welfare and meeting animal behavioural needs. Consequently, respecting wildlife and the environment is of importance within organic farming (Internet, EC 1, 2017).

The Swedish Board of Agriculture (2016) characterizes organic farming through focusing on three main aspects:

1. **Minimize weed and pests.** Planned diverse rotations are important in organic farming to reduce pests and diseases, which also allow cultural methods of weed control (Watson *et al*., 2002).

2. **Supply of crop nutrition.** Nutrients supply depends on the use of legumes and limited inputs of nutrients supplements. To recycle nutrients around the farm, a thorough control of manure and crop residues is required (Watson *et al*., 2002).

3. **The matter of animal production.** Integration of animals into farming systems is beneficial due to the circulation of nutrients. Furthermore, animals make use and care of land areas, which prevent it from overgrowth and contribute to a diversified farming system (Vaarst, 2015).

This thesis was initially only intended to focus on the second aspect above, but the problem seems to be more complex:

The supply of plant nutrient and the keeping of livestock should be balanced in organic farming. Animals must primarily be fed with feeding stuffs produced on the farm and the farmyard manure should principally be used on the arable land (Internet, Jordbruksverket 2, 2017).

This implies that the second and the third aspects are interrelated; hence the third aspect will also be of importance for this thesis. In fact, the second aspect is controlled by the third aspect since organic farmers should primarily use farmyard manure from their own animal production (Riesinger, 2006). Moreover, it´s important to use nitrogen-fixing plants such as grain legumes and grassland in diverse rotations because they can fix nitrogen from the air (Watson *et al*., 2002). Furthermore, organic farmers could use organic farmyard manure from other organic farmers and certain types of conventional farmyard manure. However, it´s not allowed using inorganic fertilizers, while organic fertilizers are approved. Organic fertilizers are usually made of from Swedish slaughter- and yeast production (Riesinger, 2006).

Gyllebo Gödning is the market leader in organic fertilizers in Sweden and mainly manufactures certified fertilizers for organic farming under the brand name Biofer. The company is a joint-owned subsidiary of Lantmännen. Besides Biofer, Gyllebo Gödning delivers specialty fertilizers on contract to many of Sweden´s leading wholesalers (Internet, Gyllebo 1, 2017). Lantmännen is northern Europe's leading cooperative in agriculture, machinery, bioenergy and food products. Lantmännen is owned by its members, consisting of 27 000 farmers and the cooperative has 10 000 employees, in more than 20 countries (Internet, Lantmannenlantbruk 2, 2017). According to Lantmännen's own company description, they aim to refine the resources of arable land in an innovative and responsible way. The company aims to participate through the whole value-chain from field to fork while regarding the business impact on people and environment (Internet, Lantmannenlantbruk 2, 2017). According to Lantmännen, this is important to develop businesses that contribute to a profitable sustainable development. Lantmännen´s mission is to contribute to profitability for the owners of farms and to optimize the return of the owners' capital in the cooperative (Internet, Lantmannenlantbruk 2, 2017).

1.2 Problem

Lantmännen announced in a press release in January 2017 that the cooperative wants to double its trade of organic grain from 100 000- to 200 000 tons by year 2020. The decision was based on a need to meet the strong demand of organic grain in Sweden as well as abroad (Internet, Lantmannenlantbruk 1, 2017).

Lanmännen experience a substantially increasing demand for organic products within all the segments as well as the market for the organic products in general (Personal message, Wahlström, 2017). The increasing demand for organic products has resulted in an increased organic arable land (Internet, Jordbruksverket 1, 2017), as shown in figure 2. The increasing organic market enables new business opportunities for the Swedish farmers as well as for Lantmännen. The development of the organic farming is also of importance regarding satisfying Lantmännen´s customers, which may result in further growth for Lantmännen's business. On the other hand, organic farming tends to reach lower yields than conventional farming, whereupon Lantmännen focuses on methods to increase the yield of organic farming (Personal message, Wahlström, 2017). One important method that Lanmännen uses to increase the yield is supplying the organic fertilizer Biofer. Fertilizers are one of the most important inputs in agriculture to increase the yield; the nitrogen effect of Biofer corresponds to 80 % of inorganic fertilizers (Gruvaeus, 2003). Delin & Stenberg (2014) concludes in their study of field trials from southwest Sweden that one kilo added nitrogen on average results in ten kilos increased yield. This further proves that fertilizers are important to increase the

yield. Moreover, Delin (2012) shows in field trials on spring wheat that organic fertilizers could double the yield compared to unfertilized spring wheat.

As previously mentioned, Lantmännen suggested that an increased use of fertilizers will result in an increased yield. This idea is supported by basic production theory and more particularly the production function. Every company uses inputs and produces output. This phenomenon could be described by the production function, explaining the quantity the producer will produce (Perloff, 2011). The produced quantity depends on the inputs; raw materials, capital and labor etc. The product function is usually described using the two inputs labor and capital (Perloff, 2011). Furthermore, the quantity (Q) depends on the numbers of working hours (L) and the amount of capital (K). Perloff (2011) presents this connection using the following formula:

$$Q = f(L, K) \qquad \textit{Equation 1}$$

Equation 1 shows a product function, where Q is a function of L and K. In other words, the quantity is a function of the inputs. If the company increases its production i.e. the quantity, it must be at the expense of increasing inputs (Perloff, 2011).

Even though the demand for organic products as well as organic arable land has increased, the trade of the important input Biofer has been relatively stable during the same period (Personal message, Wahlström, 2017), as seen in figure 1.

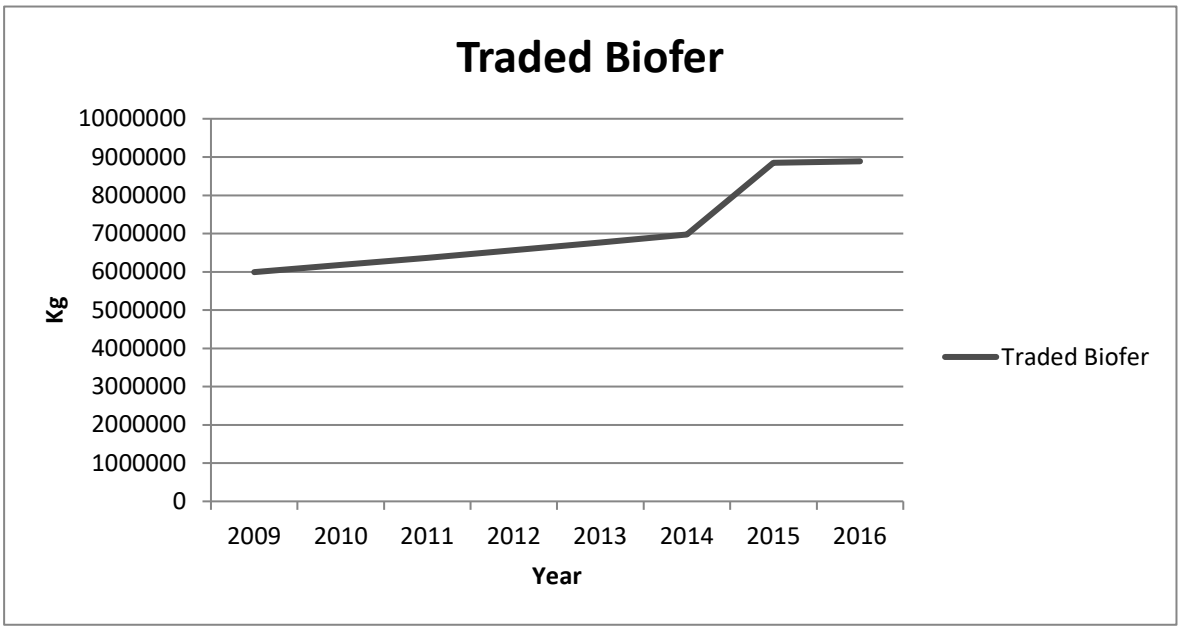

Figure 1. Traded volumes of Biofer. Own modification (Personal message, Wahlström, 2017)

According to Söderberg (2005), the average organic Swedish farmer is using a dose of 56 kg N/ha from organic fertilizers. The average content of nitrogen from the traded Biofer is 10 % (Personal message, Wahlström, 2017). In figure 2, the researcher has divided the total volume of traded Biofer by 56 and multiplied it with 0,1 to get the quantity in the average dose of kg N/ha. This calculation is made to make it possible to put Biofer in relation to the organic arable land.

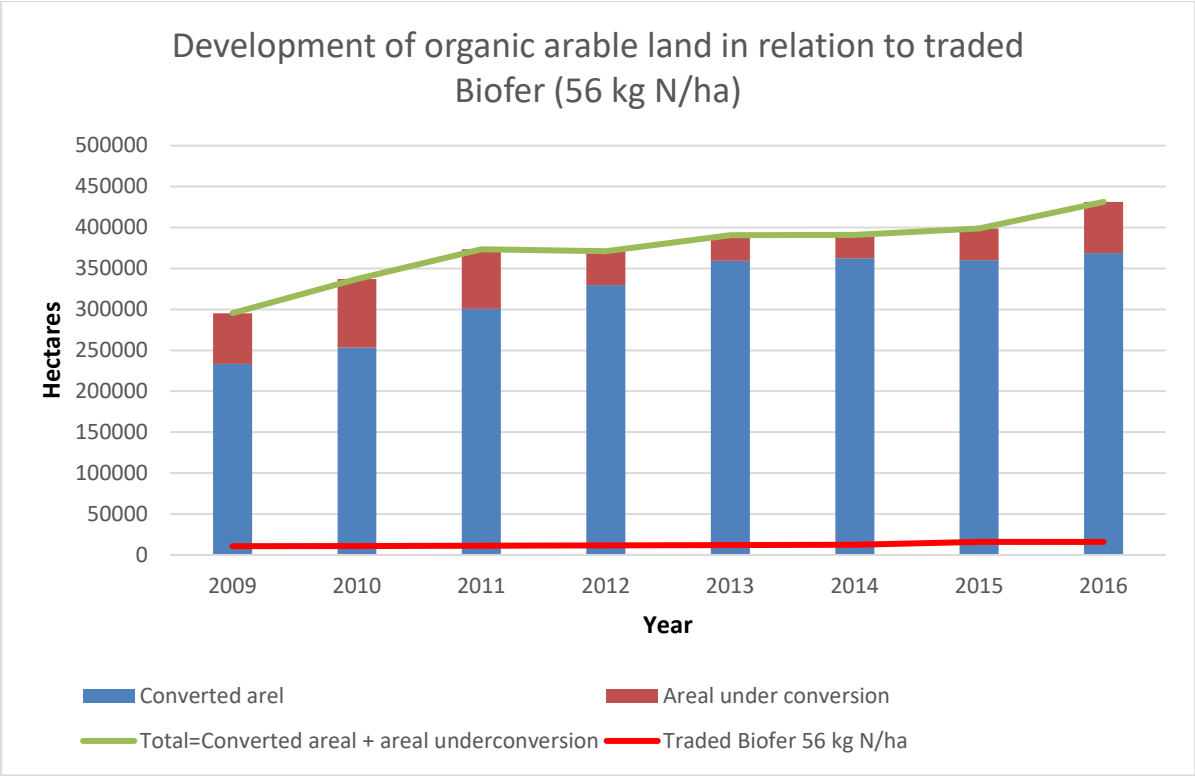

Figure 2. Increase of organic arable land in Sweden in relation to traded Biofer. Own modification (Internet, Jordbruksverket 1, 2017; Personal message, Wahlström, 2017)

To sum up the problem, there is an increase in organic arable land due to higher demand for organic products. Lantmännen wants to meet this higher demand by doubling the trade of organic grain by year 2020. On the other hand, Lantmännen supplies Biofer - one of their most important inputs for increasing yields of organic production. However, Biofer has been traded on a relatively stable level over the years. This is problematic since the organic arable land as well as demand for organic products has increased but the trade of Biofer has not increased correspondingly. If this trend continues, Lantmännen might run into problems to reach the mission of doubling the trade of organic grain by year 2020.

1.3 Aim and delimitations

The aim of this study is to investigate why the trade of Lantmännen´s organic fertilizer Biofer doesn't correspond to the increase in the use of land for organic farming. To achieve the aim, the following research question is answered in this project:

Why doesn´t Lantmännen´s and farmers' trade of the organic fertilizer Biofer correspond with the increase of organic arable land?

This thesis focuses on Lantmännen, the leading agricultural cooperative in Northern Europe considering the four divisions (Internet, Lantmannenlantbruk 2, 2017). The researcher consequently believes that it's the most representative supplier to follow, as a complement there will also be a small section of the study scrutinizing their most discernible competitors. Although conventional products are the main trade for Lantmännen, this study focuses on organic products due to the company´s standpoint of double the trade of organic grain by year

2020. Lantmännen is offering thousands of products but this study only focuses on the products manufactured by Gyllebo Gödning, since they are the largest supplier of organic fertilizers (Internet, Gyllebo 1, 2017). Gyllebo is thereby an important actor to reach Lantmännen´s mission to double the trade of organic grain. Even though Lantmännen is a large cooperative acting in various countries, the study intends to focus on the Swedish market because it's undoubtedly the superior market for Gyllebo Gödning´s products. The fertilizers in Gyllebo´s products contain a lot of elements, but this thesis focuses on nitrogen since it´s the element that´s needed in the largest amount and often the element that determine the fertilization dose (Hansson, 2002).

1.4 Outline

To get an overview of the thesis, figure 3 explains the study´s outline containing an introduction of all the chapters.

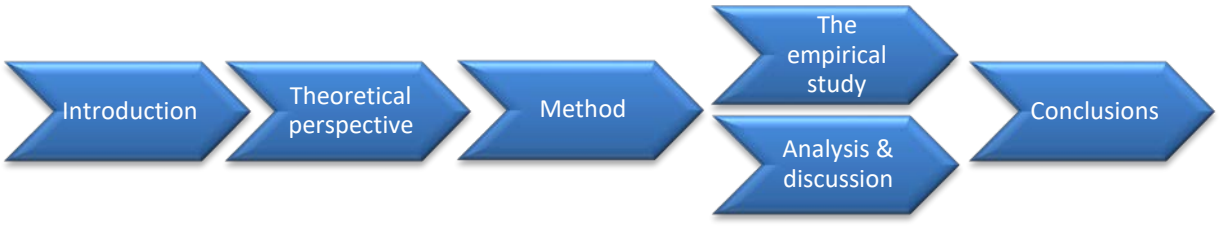

Figure 3. Illustration of the Outline of the thesis. Own modification.

Chapter one - Introduction

Chapter one presents the problem background in order to understand the problem. The problem generates the aim of the study, which is reached by the research question. Finally, there will be delimitations explaining what parts of the research field that the research question doesn't intend to answer.

Chapter two - Theoretical perspective

In chapter two there will be a presentation of theories applied for this study in order to analyse the problem. The theories presented will furthermore be the base for the analysis of the empirical material in chapter five.

Chapter three - Method

Chapter three presents the choices of methodological approach and research design as well as arguing for the motivations of those choices.

Chapter four – The empirical study

Chapter four introduces the interviewed farmers´ businesses followed by a compilation of the farmer´s view´s based on the aim of the study.

Chapter five – Analysis and discussion

In chapter five the empirical study will be analysed and discussed regarded from the theoretical perspective.

Chapter six - Conclusions

Chapter six will discuss the achievement of the aim and suggestions for future research within the research field.

2 Theoretical perspective

This chapter provides a description of the theoretical framework upon which this study is based. The theoretical perspective in this thesis is based on a through business buying decision process. First, the reader is introduced to the business buying decision-making process followed by the most popular model within this research field, namely the buygrid model. Finally, this chapter is rounded off with a review of which factors that affect business decision making. The theoretical framework in this chapter will subsequently be the base for the analysis of the empirical material in chapter 5.

In marketing including buying decision, the researcher always needs to start with sorting out whether the research is applicable to a consumer market (B2C) or a business market (B2B) (Brassington & Petitt, 2013; Kotler 2001). This is of importance since those markets are operating differently, which results in differences when it comes to relevant theories (Brassington & Petitt, 2013). The business market is described by Kotler (2001) as: "All the organisations that buy goods and services to use in the production of other products and services". This thesis involves farmers buying goods from Lantmännen to produce grains, which according to Kotler´s (2001) definition constitutes a business market. Consequently, this thesis will be based on theories applicable to a B2B-market.

2.1 The business buying decision-making process

The business buying behaviour is complex to analyse. Many models have been developed in attempts to explain business behaviour over the years. Critics complain that there´s been little progress in defining business buying behaviour despite comprehensive efforts (Banting *et al*., 1991). Furthermore, there´s been criticism that many of the models for business buying behaviour lack replication i.e. repeating a study using same methods but with different subjects (Banting *et al*., 1991; Bryman & Bell, 2015). Furthermore, many critics claim that models have been developed from relatively small samples that sometimes even lack representativeness. The researcher is aware of the deficiencies of business buying behaviour, and thereby uses the most common and well-known theories used by the most known researchers in marketing. The researcher furthermore believes that those models are in order because they are true attempts to better understand business buying.

Figure 4. The business buying decision-making process. Own modification (Kotler, 2001; Haas, 1992)

Problem or need recognition

As seen in figure 4, the first stage of the process is the problem or need recognition. This stage of the process is clear and essential; there must be a need or a problem that could be solved through a purchase (Haas, 1992). The problem or need recognition could result from either internal or external stimulations (Kotler, 2001). The internal problem recognition is detected within the company that manufactures and sells the product (Brassington & Petitt, 2013). It usually occurs when the company launches a new product that requires new production equipment or using other materials. Another possibility is that the purchasing manager is dissatisfied with the supplier´s product, service or prices etc. (Kotler, 2001). The External problem recognition is emerged from the buyers, usually because the product doesn't cover the buyers need or budget. Another possibility is that other companies supply a better product or price for the buyers (Kotler, 2001).

General need description

When the buyer at this stage has recognized the need, the next step is to prepare the general need description, including the characteristics and quantity of the needed product (Kotler, 2001). For standard products, it´s fewer problems than for complex products which commonly makes the buyer obliged to work with others to define the product (Brassington & Petitt, 2013). The buyer and the collaborators rank the attributes of the product, usually concerning durability, reliability and price (Kotler, 2011). A seller that can define the buyers need and provide information of the product´s characteristics has an advantage (Haas, 1992).

Specification of product

Unlike the consumer market, the business market usually handles components that should be incorporated into an end product (Brassington & Petitt, 2013). The matter of specification of the components characteristics in terms of its function, design, quality and compatibility with other components are thereby of importance. There are also less tangible but even more important factors such as price, quantity, delivery and service etc. (Brassington & Petitt, 2013). The specifications need to be balanced against the products cost and practicality, which advantageously could be done by value analysis (Kotler, 2001). Value analysis compares the function by a purchased product with its cost to find a lower cost alternative (Haas, 1992). Components of the product are studied to determine whether they can be redesigned, standardized or made less costly (Kotler, 2001). Buyers usually make purchasing decisions under time pressure, why they sometimes end up with a product or a price that´s unnecessary. By the value analysis, the customer can review the product and the costs after their decision has been made (Haas, 1992).

Search for potential suppliers

The next stage involves searching for a suitable supplier who best matches the specifications in the previous stage (Brassington & Petitt, 2013). This has been considerably facilitated due to technology, above all, the internet (Kotler, 2001). The buyers are thereby able to list all the potential suppliers and compare them to find who best matches their requirements of specifications. Furthermore, this has resulted in advantages for especially small suppliers, who at a nominal fee get as much space as the larger suppliers (Kotler, 2001). The newer the task, and the more complex and costly the product is the more time will be spent by the buyer to search supplier (Kotler, 2001). A low risk, frequent purchase will not involve a large search, most commonly the buyer just asks the existing supplier for a resupply (Brassington & Petitt, 2013). If less frequent purchase, one or two other suppliers will be requested, just to make sure the existing supplier doesn´t take advantage of the relationship. In high risk, infrequent purchase i.e. new task, a more comprehensive research of suppliers will likely be completed. This research will include a complex discussion and negotiation with several suppliers before a decision can be made (Haas, 1992).

Kumar & Kapoor (2017) has recently completed a study based on data from 278 Indian farmers. The farmers were on average having conversations with 2,18 suppliers and were using 2,05 information sources during the search stage for the frequently purchased agri-input fertilizers (Kumar & Kapoor, 2017). When it comes to the infrequently purchased input tractors, the same farmers were on average having conversations with 6,31 suppliers and was using 4,46 sources of information (Kumar & Kapoor, 2017). The number of conversations with suppliers was dependent on the frequency of purchases and experience when it comes to frequently purchased inputs as fertilizers. In the case of tractors and infrequent purchased inputs, the farmers were dependent on decision to buy the product, perceived importance of the product and lack of knowledge of the product (Kumar & Kapoor, 2017). Furthermore, the number of information sources was dependent on the perceived importance of the product, options available for the product and the credibility of the sources (Kumar & Kapoor, 2017).

Obtaining supplier proposal

In this stage, the buyer is now able to invite the qualified suppliers to submit proposals (Kotler, 2001). Depending on the complexity and the price of the product the suppliers´

responses varies. When the product is uncomplicated and cheap, the supplier usually only sends a catalogue or at best a salesperson. If on the other hand, the product is complex and expensive, the buyer usually requires a detailed proposal from every potential supplier (Brassington & Petitt, 2013). This stage is the only stage where the selling company has a great chance to affect and convince the buying company why it should buy their product. The proposal is not just a technical document but also a marketing document. Thus it´s important for the selling company to market their product so it differentiates from the competitors (Haas, 1992).

Evaluating and selection of proposals

The buyer is now evaluating the proposals before a selection of supplier can be done (Kotler, 2001). According to Kumar & Kapoor (2017), the farmers were on average evaluating 2,08 suppliers for fertilizers, compared to 5,72 suppliers for tractors. The explanation is according to Kumar & Kapoor (2017) dependent on the price of the input, complexity of the product, the farmers' knowledge about the products and the frequency of the purchase of the products. The selection of supplier is according to Kotler (2001) based on what´s important for the supplier, which is individual, but some of the most common factors concerning the product are quality, service, delivery and competitive prices. Other important factors around the product include communication, advice, geographical location, performance history and reputation (Kotler, 2001). The buyers will rate those different factors by priority and thereafter select the supplier who best achieves the factors that are important for the buyer (Brassington & Petitt, 2013).

According to the results of the study of Kumar & Kapoor (2017), the buying decision time for fertilizers is semi-long, in average 12,87 days. Compared to seeds, which has a buying decision time of 2,93 days, whereas the infrequent purchase of a tractor has a long buying decision time of 76,18 days. The buying decision time for fertilizers witness of a rather low risk and frequently purchased product. The authors claim the difference in buying decision time depends on the lack of knowledge about the benefits of fertilizers, urgency of using it and efforts to minimize costs (Kumar & Kapoor, 2017).

Selection of an order routine

The buyer is now preparing an order routine for the final order with the selected supplier. The order routine includes quantity needed, time of delivery and technical specifications. It also includes return policies and warranties, in case the supplier doesn't meet the requirements of the order routine (Kotler, 2001). Nowadays it has been popular to use blanket contracts, a long-term relationship, where the supplier resupplies the buyer when needed. This usually occurs at a predetermined price and time (Brassington & Petitt, 2013). This type of contract avoids the costly process of renegotiation every time the buyer needs a new stock at the same time as the buyer avoids storage costs (Brassington & Petitt, 2013).

Feedback and post purchase evaluation

In this last stage, the buyer reviews the performance of the supplier, usually by having contact with another user and analyses their satisfaction. The review of the supplier may lead to a continued business collaboration, a modified collaboration in case something has to be changed or a termination of the collaboration if there´s no chance in continuing or modifying the collaboration (Kotler, 2001). The seller needs to act in the same way as the buyer, to make

sure that the buyer is satisfied with the product and the collaboration (Brassington & Petitt, 2013).

2.2 The buygrid model

"Probably the most accepted model of the business buying process" (Haas 1992, p.201)

The buygrid model is one of the most useful and enduring of all the models that have been developed of organisational buying behaviour (Haas, 1992). It´s furthermore described as "one of the most useful analytical tools for both academicians and practitioners interested in organisational buying behaviour" (Moriarty 1983, p 29) However, besides the popularity of the model there are some notable critics of it. Bellizzi & McVey (1983) claims that the buy phases of the model have never been empirically justified. Furthermore, the model is not able to represent purchases of all kinds of products, since it represents some products better than others (Bellizzi & McVey, 1983).

Table 1. The buygrid model. Own modification (Haas, 1992).

		Buyclasses		
		New Task	Modified rebuy	Straight rebuy
Buyphases	1. Problem or need recognition	Yes	Perhaps	No
	2. General need description	Yes	Perhaps	No
	3. Specification of product	Yes	Yes	Yes
	4. Search for potential suppliers	Yes	Perhaps	No
	5. Obtaining supplier propsal	Yes	Perhaps	No
	6. Evaluating proposals and selection of suppler	Yes	Perhaps	No
	7. Selection of an order routine	Yes	Perhaps	No
	8. Feedback and post purchase evaluation	Yes	Yes	Yes

Buy phases

The buy phases in the Buygrid model is the same as in the business buying decision-making process, which was described in the previous section in chapter 2.2.

New task

The buyers are facing a new task when they are buying a product for the first time (Kotler, 2001), which makes it the most complex category since the buyer doesn't have any previous experience of this kind of purchase (Brassington & Petitt, 2013). Due to the lack of experience, it's important for the buyer to collect as much information as possible, especially if it involves a high cost and/or a high-risk product (Haas, 1992). Furthermore, this is an interesting buyclass for the sellers since if the buyers are satisfied it could lead to business on regular basis (Brassington & Petitt, 2013) i.e. some of the following buyclasses: modified- or straight rebuy.

As seen in table 1, in the new task buyclass all eight buy phases are important, but the first few are indispensable (Haas, 1992). The seller must meet the buyers' requests phase by phase since it´s a new experience for the buyer, which ideally leads to straight rebuy situations (Haas,1992).

Modified rebuy

Unlike new task, there´s some experience of buying the product in modified rebuy, but also a need to modify the current process (Brassington & Petitt, 2013). Most commonly the buyers want to modify the product specifications, prices or suppliers (Kotler, 2001). The decision making is usually longer and involves more participants compared to the straight rebuy (Brassington & Petitt, 2013; Kotler, 2001). Modified rebuy tends to bring competitions to the current supplier that will try to modify and maintain the customer and competitors who want to gain new businesses (Kotler, 2001).

As seen in table 1, in this category the early as well as the later phases are important, giving that the middle phases are less important (Haas, 1992). If modified situations occur, the buyers must be prepared to look elsewhere for solutions. The sellers need to provide information for the buyers, making a change possible. Once this is fulfilled, the seller must follow the rest of the buy phases and make sure the buyer is satisfied throughout the whole process (Haas, 1992). This category is like new task considering both categories strive for change the situations to straight rebuy (Haas, 1992).

Straight rebuy

Straight rebuy is the simplest buyclass, where the company reorders a product without any modifications (Kotler, 2001). The buyer simply chooses from its list of suppliers, where the chosen supplier is based on the buyer's past buying satisfaction (Brassington & Petitt, 2013). Furthermore, the chosen supplier tries to maintain the quality of the product to maintain the buyers. The competitive supplier tries to offer something new to make the buyer dissatisfied with the current supplier and thereby might consider a change of supplier (Kotler, 2001). The competitive suppliers try to "steal" the buyer gradually, by first trying to get some small orders and then enlarge them over time (Brassington & Petitt, 2013).

As seen in table 1, the early buy phases are not very important, because the buyers are already familiar with the product and at this point probably know what they need to know (Haas, 1992). For the seller, the phases 7 and 8 are important in order to make sure that the competitors don't get any opportunities, at the same time that they are searching for those opportunities among the competitors (Haas, 1992).

2.3 Factors affecting business decision making

There are both external and internal organisational factors that determine the purpose of the decisions (Lee *et al*., 1999). The external factors will determine the business' strategic decisions, while the internal factors influence the individual decisions (Lee *et al*., 1999). This Thesis will accordingly be oriented on the external decisions, since it´s concerning a B2B – market between Lantmännen and farmers, hence it´s the business' strategic decisions that are interesting rather than individual.

As seen in figure 5, the external factors affecting the company´s decision making is divided into general and specific factors. The general factors include those factors outside the businesses and comprise: globalisation, technology and political- and economic conditions (Lee *et al*., 1999), which constitutes the outermost layer of the circle. The middle layer of the circle constitutes the specific factors, including those factors that are directly related to the achievement of the business' goals. Those factors include competition, customers, labour market, pressure groups and suppliers (Lee *et al*., 1999).

Figure 5. External factors affecting business decision making. Own modification (Kotler, 2001; Lee et al., 1999; Brassington & Petitt, 2013)

2.3.1 The general factors affecting the business decision making

Globalisation

Globalisation refers to marketing concerning integrating marketing actions across different geographic markets (Kotler, 2001). The world economy has globalised resulting in new opportunities and problems (Brassington & Petitt, 2013). If issues like economic, political and technological affect businesses then it´s clear that those factors also need to be considered in a global perspective (Lee *et al.*, 1999).

Economic conditions

The economic perspective relates to how the company's resources are used and distributed (Lee *et al*., 1999). The economic factors include inflation, wages, taxes and most importantly the cost of the raw material (Brassington & Petitt, 2013). Furthermore, the economic

conditions are characterized by factors that affect the purchasing power, which all the previous mentioned factors do (Kotler, 2001). Those economic factors are affecting both the buyer and the seller (Haas,1992).

Political conditions

The marketing decisions are affected by the political conditions including laws, government and pressure groups that have an impact and a limitation for the company in a given society (Kotler, 2001). The company is primarily affected by the political conditions due to market controls or legal changes from governments (Lee *et al*., 1999). This thesis concerns the Swedish market, where the political conditions are mostly controlled by national and local government and the European Union (Brassington & Petitt, 2013).

Technology

Technological improvement has had an importance for most of the areas within businesses (Brassington & Petitt, 2013). New technology creates new opportunities on the market, but at the same time, it prevents the previous opportunities since new technology replaces the older one (Kotler, 2001). Historically, countless companies have ignored new innovations in technology, resulting in a decline of business or even bankruptcy. This makes it very important for companies to keep up with technological innovations to avoid being overtaken by competitors (Haas, 1992). Companies investing in new technology has been proven to be more cost-efficient, competitive and profitable (Lee *et al*., 1999).

2.3.2 The specific factors affecting the business decision making

Suppliers

The suppliers provide the resources that the company needs to produce its goods or services. The supplier plays an important role for the company, since shortages or delays may lead to lost sales or even worse to customer dissatisfaction which could make the company lose income (Kotler, 2001). Furthermore, the issues of suppliers are concerning the number of suppliers, the quality of their products and reliability of delivery (Lee *et al*., 1999). If those criteria are fulfilled by the supplier it facilitates the company´s stock control and the ability to change manufactured volumes (Lee *et al*., 1999).

Customers

Understanding the customers is crucial for the company´s success, such knowledge helps the company to decide what to produce and what to change to keep up to customer expectations (Lee *et al*., 1999). The company needs to know who the customers are (B2B or B2C) and their reasons for buying the product to know how they could reach them through their marketing (Brassington & Petitt, 2013).

Competitors

The degree of competition determines the way in which the business is handling and consequently which decisions that are made (Lee *et al*., 1999). Determining who the company´s competitors are could be a challenging task. Michael Porter (1980) distinguishes competition in five different ways:

1. **Current competitors -** the firms that the business is competing with now or has traditionally competed (Porter, 2004).

2. **New competitors** – When unexpected new firms are entering the market (Porter, 2004).

3. **Product substitutes** – The products that customers perceive as substitutes for existing ones. These products don't have to be indistinguishable, but customers see the function of them similar (Porter, 2004).

4. **Customers** – Bargaining power, able to hold down profitability from the firm by forcing prices down, request higher quality or playing competitors against each other (Porter, 2004).

5. **Suppliers** – Bargaining power, able to hold down profitability from the firm by raising prices and/or reducing quality (Porter, 2004).

Labour market

Related to labour wages rate and the supply of skilled labour as well as labour in general (Haas, 1992). Those factors determine how many people that could be employed at a certain wage rate and whether the labour has qualified skills (Lee *et al*., 1999). The situation where an external factor will determine the decision could, for example, arise when the company wants to recruit people, but can´t find people with desired skills. The decision, in that case, is based on whether to recruit outside the area or to train them to desired skills (Lee *et al*., 1999).

Pressure groups

These are groups with an interest to raise awareness about specific issues concerning a company´s policies. The aim for the pressure groups is to make the company change their policies, usually using media as a tool to reach their aim (Lee *et al*., 1999). A classic example is Greenpeace raising awareness of Shell dumping oil in the sea. Greenpeace managed to change Shell´s mind after damaging the company´s image by making it a world news in media (Bakir, 2005).

2.4 Theoretical synthesis

This section presents a summary of the problem and how the research question will be answered by the theoretical framework in order to achieve the aim, as explained in table 2.

1. The problem is that there has been an increase in the organic arable land that does not correspond with the demand for Biofer. The demand for organic products has been substantially increasing while the market demand for Biofer has remained stable during the same period.

2. The theoretical framework first describes the business buying decision-making process, followed by the factors affecting the buying decision. The researcher will be addressing the aim by answering the research question through an interaction with the theoretical framework presented in this chapter:

Table 2. Theoretical synthesis. Own modification.

	Global	Technological	Economic	Political	Suppliers	Competition	Customers	Labour market	Pressure groups
Problem or need recognition									
General need description									
Specification of the product									
Search for potential suppliers									
Obtaining supplier proposal									
Evaluating proposals and selection of supplier									
Selection of an order routine									
Feedback and post purchase evaluation									

3. By interacting those theories, the researcher will find where in the buying process the problem is/are and the factors will determine what´s the reasons behind it. In other words, this column will be the answer to the research question and consequently also address the aim of the thesis:

   Why the trade of Lantmännen´s organic fertilizer Biofer doesn't correspond to the increase in the use of land for organic farming.

3 Method

In this chapter, the premises of the thesis are presented considering the chosen methodological approach, design and strategy, followed by an argumentation of the motivations of those choices. Thereafter follows a discussion of how to assure the quality of the chosen methods. Finally, there will be an explanation of how the data for this study was collected and how to make sure that the data process follows some important ethical considerations.

3.1 Conceptual framework

The idea with the conceptual framework is to identify the people who will participate in the study; decide which parts of the information that´s important; relationships and features involved in the study and what data the researcher needs to collect and analyse (Robson, 2011). Furthermore, the conceptual framework helps the researcher to categorize different concepts which facilitate the analysis. The conceptual framework supports the researcher both before the empirical study as well as after when the collected data should be analysed (Robson, 2011). Trafford (2007) stresses the importance of the strengths of conceptual framework and claims that a thesis which has no conceptual framework is unlikely to be successful.

The empirical data in this study is gathered from four interviews with organic farmers in Östergötland. Those farmers were identified as the people who will participate in this study since the researcher believed they were suited for delivering the desirable data at the same time as they were willing to participate. Their willingness to participate and their knowledge within the research field was the reason for choosing them for this thesis. All interviews were recorded after approval from the farmers. From the records, the interviews were consequently transcribed. This was a time-consuming process since the researcher conducted the interviews in Swedish, why it was necessary to transcribe in Swedish and then translate it into English. The researcher thought this was the best way of retelling the interviews as accurate as possible. Furthermore, the researcher was familiarized with the data while doing the transcription which was also valuable for the analysis. The interviews were at last sent to farmers, three of them wanted a copy of the recordings and the last one wanted a copy of the Swedish transcription. The author cannot guarantee that the farmers were evaluating the interviews, but they have had the chance to change or disapprove of the material. Since the interviews were unstructured the questions did not end up in the same order. Finally, the researcher rearranged the transcriptions making them easier to fit the theoretical model, which also facilitated the conduction of the analysis.

The data needed consisted of how the farmers provide their crops with nitrogen. The researcher first wants to sort out how the supply of manure affects the demand for organic fertilizers. Furthermore, the researcher wants to know the farmers' reasons when it comes to which organic fertilizer they prefer. The conceptual- and theoretical framework thereafter makes it possible for the researcher to categorize different concepts via the business buying decision process and the factors affecting it. This is an advantage for the researcher since the theoretical model hereby can pinpoint where a concept is placed and also what´s affecting it. Furthermore, it facilitates the conducting of the analysis, knowing what to analyse and how to analyse it.

The analysis was conducted, using the described conceptual- and theoretical framework. Thus, the researcher found that the economic conditions affected the farmers' buying decision within all buy phases, making it the priority of analyse. The collected data from the interviews provided the researcher with an overall understanding of the farmers´ buying decision process. Furthermore, the data covered the problem or need recognition and the affecting technology of product specification. On the other hand, the researcher did not get the whole picture from the collected data when it comes to the general need description- how the product substitutes affect the farmers economically, neither does the researcher fully understand the matter of price considering the specification of the product. Finally, the researcher lacks knowledge of the search and selecting supplier phase, when it comes to the competition among the suppliers. Those three are issues which the researcher wishes to get a deeper understanding of to contribute to a business and marketing understanding. When sorting those three issues out the researcher has an understanding of the whole buying decision process of the farmers, since the two last buy phases are given by the previous ones. The order routine is based on the general need description and the product specification and the feedback are based on all the previous buy phases. The mentioned issues will thereby be the basis for the analysis and discussion in chapter 5.

3.2 Methodological approach - Qualitative

Researchers distinguish two basic approaches when it comes to the choice of method, qualitative and quantitative (Robson, 2011), the distinctions are shown in table 3. The quantitative method is briefly a collection of numerical data, the relation between theory and research has a deductive approach, where the principal focus is to test theories (Robson, 2011). Furthermore, this method´s epistemology is associated with natural science, especially the positivism that advocates scientific methods to study the social reality and all its aspects. The view of the reality is objectivistic, an ontological standpoint arguing for that social phenomenon and their value has an existence that is irrespective of social actors (Bryman & Bell, 2015).

The qualitative method differs from the quantitative method in many aspects, but here the most fundamental will be mentioned which also are illustrated in table 3. Qualitative research is usually more concentrated on words rather than numbers, the relation between theory and research has an inductive approach, where the focus is to generate theories from the collected data (Robson, 2011). The epistemology is interpretive and in contrast to natural science, the view of the social reality can only be described by how the participants of an environment interpret this reality. The ontological standpoint is associated with constructionism, which means that social characteristics are the result of interaction between individuals (Bryman & Bell, 2015).

Table 3. Summary of primary differences between quantitative- and qualitative research (Bryman & Bell, 2015).

	Quantitative	**Qualitative**
Theory in relation to research	Deductive- testing theories	Inductive-generating theories
Epistemological standpoint	Natural science, above all positivism	Interpretive viewpoint
Ontological standpoint	Objectivism	Constructionism

This thesis is applying the qualitative method since it has an inductive approach, where the focus on the collected data is to generate theories rather than testing them. The epistemological standpoint in this thesis is interpretive since the reality is based on interviewees and how they interpret the studied field. The ontological standpoint is constructionist rather than objectivistic because the social phenomenon is not irrespective of social actors since they are the ones creating it. The thesis is more concentrated on words, even though there are some data dependent on statistics and numbers, one could thereby say that this thesis has some quantitative influences.

This thesis has a qualitative method, whereupon it would be relevant for the study and the researcher to be aware of what advantages and risks this implementation may entail.
The following table 4 summarizes some important strengths and weaknesses concerning qualitative method.

Table 4. Strengths and weaknesses using the qualitative method. Own modification (Bryman & Bell, 2015, Robson, 2011)

Strengths	**Weaknesses**
Emphasis on context Contains a detailed description of the studied social reality, which has an importance in the context where people act and their social behaviour. Qualitative researchers claim that to find out the behaviour of a social group, it must be considered to the environment they are operating in.	Subjective Many quantitative researchers claim qualitative results for being too dependent on the researcher's perceptions of what's important. Furthermore, qualitative research is accused of having too personally relationship to their study participants, which affect the results in a subjective way.
Process Qualitative research tends to perceive social activities in terms of processes. Most important during the process is to describe how phenomenon evolves over time. Consequently, qualitative researches focus on changes and development.	Difficulties to replicate the study Qualitative studies have difficulties to replicate the study due to subjectivity and the unstructured approach.
Flexibility It´s easier for qualitative researchers than quantitative researchers to change orientation and focus during the study. It depends on data collection is much more systematic in quantitative research.	Problems with generalization Qualitative research implements participant observations or unstructured interviews with a small number of individuals in a specific place. Critics argue that it's impossible to generalize such results to other environments.
Viewpoint of participants Quantitative research and natural science unlike qualitative research and social science don´t attribute meaning to the surroundings, which people do. Those people also can reflect the social reality they experience, which qualitative research makes use of unlike quantitative.	Lack of transparency Transparency concerns information about how a study was planned and implemented. In qualitative studies, it could be hard to pinpoint what the researcher concludes. Qualitative researchers tend to be unclear when for example explaining the reason for the chosen participants in an interview or an observation.

The characteristics that lead to the strengths of qualitative methods also lead to weaknesses. The weaknesses of the qualitative method doing this thesis are discussed in the last paragraph in chapter 3.4.

3.3 Research design - Case study

A research design explains how the researcher is going to turn research questions into projects. The design can either be fixed, flexible or multi-strategy. Case study is a flexible design, where it develops during the data collection. The data is typically in the form of words; hence this type often uses a qualitative strategy (Robson, 2011).

Researchers have different views of how to define case study, hence there are several definitions of the term (Bryman & Bell, 2015). Robert Yin has done much research about case studies and his definition is common in textbooks and is well-recognized (Robson, 2011, Bryman & Bell, 2015)

*"Case study is a design for doing research which includes empirical investigation of social phenomenon in its real-life context proved by evidence from different sources "(*Yin, 2009)

The method of case study is relevant to use when the research question intends to explain present circumstances of "how" or "why" some social phenomenon is composed.
Those phenomena should be investigated in depth and in the context of its real life, especially when there is no clear line between phenomenon and context Yin (2009).

The purpose of the research question in this thesis is to find out why organic fertilizers don't sell more extensively and what´s the reason behind it. It´s a question of "why" that investigating the phenomenon of why farmers don't buy the product more extensively, in the context of organic farming. The researcher believes that case study is the most relevant research design for this thesis.

This thesis has a qualitative method with an inductive approach using case study as research design. Having this disambiguated, it would be relevant for this research to find out what´s the pros and cons using case study with an inductive approach. The following table 5 summarizes some important strengths and weaknesses concerning building theories from case studies.

Table 5. Strengths and weaknesses building theories from case studies. Own modification (Eisenhardt, 1989)

Strengths	**Weaknesses**
When trying to connect evidence from different data, cases and investigators the possibility of reframing a new theoretical viewpoint increases.	Too intense use of empirical evidence can result in theory that tries to capture everything, ending up being too complex
The generated theory is likely to be tested with constructs that can be measurable because they have already been measured during the theory-building process.	Building theory from cases may result in a narrow theory with the risk that it describes an over sensitive phenomenon that´s hard to explain.
High probability of valid theory because the process of building the theory is related to evidence, which results in a likelihood that the theory will correspond with empirical observation.	Specifics of data produce the generalization of theory, with the risk that the theorist if using nonspecific data is unable to prove generality of the theory.

The characteristics that lead to the strengths in theory building from case studies also lead to weaknesses. This thesis is using theory that is very rich in detail, which could imply difficulties getting an overall perspective. The researcher is aware of the importance of getting an overall perspective, otherwise, there´s a risk that the researcher is unable to distinguish

relationships between different cases and a specific case. The purpose of case studies is to understand a specific process, which in general causes difficulties of generalization. Moreover, this thesis is based on interviews with four farmers located in a relatively limited geographical area. Thus, the researcher is aware of the problematically of generalization in this thesis since it´s focusing on a specific process in a limited geographical area.

3.4 Quality assurance - reliability and validity

Reliability and validity have been discussed among many qualitative researchers considering how relevant those concepts are to qualitative research (Bryman & Bell, 2015). According to Stenbacka (2001) and Morse *et al*. (2002), a qualitative study that has reliability and validity as a criterion is rather a study that is no good and shouldn´t be taken seriously. On the other hand, Patton (2001) claims that reliability and validity are concepts that the qualitative researcher should be aware of to judge the quality of the study. According to Golafshani (2003), qualitative researchers tend to claim that the terms of reliability and validity are not applicable to qualitative research. Most qualitative researchers are on the other hand agreed that there needs to be measurement to assure quality. This view has resulted in researchers developing their own concepts of reliability and validity in what they consider more appropriate concepts (Golafshani, 2003). However, this view is not shared by all qualitative researchers, Kvale and Brinkmann (2009) claim attempts to rename traditional terms just proving the view that qualitative research is untrustworthy.

The view of reliability and validity in this thesis is embraced by the view of Golafshani (2003). Hence, this thesis will discuss researchers who have developed the concept of reliability and validity appropriate for qualitative research. The scrutinized researchers are Yin (2009) and Robson (2011) who are more oriented on case studies and LeCompte & Goetz (1982) and Guba & Lincoln (1994) who emphasis qualitative studies on a more general level. Table 5 describes how the different qualitative researchers explain reliability and validity in different ways, but with the same or similar results. Furthermore, table 6 describes the quality assurance of this study in relation to the earlier mentioned researchers´ view of quality assurance.

LeComte & Goetz (1982) divide reliability and validity into internal and external parts. Internal validity seeks for causal relationships (Yin, 2009), while external validity defines how the result of a study can be generalized (Bryman & Bell, 2015). Internal reliability includes how participants of a research team manage to agree on what they perceive, while external reliability concerns the extension of how a study could be replicated (Bryman & Bell, 2015). Guba & Lincoln (1994) has a similar approach but proposes trustworthiness as a criterion for assessing qualitative research. Trustworthiness is divided into four subcriteria; credibility, transferability, dependability and confirmability. Credibility corresponds to internal validity, transferability is related to external validity and dependability is equal to reliability. The fourth subcriteria confirmability corresponds to objectivity (Bryman & Bell, 2015), but according to Robson (2011) objectivity is not valuated in qualitative research since it´s distancing the researcher from participants. Hence, this subcriterion will not be considered in this thesis. Yin (2009) and Robson (2011) has a similar approach as Guba & Lincoln (1994) and LeCompte & Goetz (1982) but differs in terms of another use of validity, construct validity. Construct validity is about finding correct measures for the concepts being studied (Yin, 2009, Robson, 2011). Yin (2009) and Robson (2011) on the other hand differ due to Robson (2011) divides construct validity into face- and predictive criterion validity.

This thesis is based on interviews with the four farmers located in a relatively limited geographical area. This makes it hard to argue for this thesis external validity since it lacks considerable factors for being generalized. This is not just a problem for this study but seems to be a general problem for case studies. The purpose with case studies is to understand a particular process, resulting in difficulties of generalizing. However, study one case may imply an increased understanding of similar cases (Yin, 2009). The internal validity strives for determining casual relationships, thus only applicable to casual and explanatory studies (Yin, 2009). This study is rather descriptive and explorative, making the issue of internal validity inept. Yin´s (2009) epithet construct validity or face- and predictive criterion validity as Robson (2011) defines it, is according to those authors maintained by letting the participants of the case study evaluate the study before it´s completed. In this thesis three of the farmers were sent the sound files containing the complete interview, the last one wanted a transcription of the interview. The author can´t guarantee that the farmers were evaluating the interviews, but they have had the chance to change or disapprove the material. The participant has had the chance to evaluate the material and the author consequently believes that the construct validity according to Yin´s (2009) requirements is achieved. The meaning of reliability is that if another researcher chooses to perform the same study using the same approach, the results should be the same (Bryman & Bell, 2015). The researcher has been supporting the reliability by doing every step as operational as possible and by during the whole process being aware of objectivity. A common criticism of case studies is according to Yin (2009) that they often been proven to have an inaccessible documentation, which won't be the case of this study since it will be published. Finally, the researcher thinks it´s important to have a thorough method presentation in order to minimize biases as well as supporting the reliability of the study.

Table 6. Similarities between qualitative researchers and this thesis quality assurance. Own modification (Yin 2009, Robson 2011, LeCompte & Goetz 1982, Guba & Lincoln 1994)

		Qualitative method, Case study			**Qualitative method in general**			
		This study Aschan (2017)	Yin (2009)	Robson (2011)	LeCompte & Goetz (1982)	Guba & Lincoln (1994)		
						Trustworthiness		
						Credibility	Transferability	Dependability
Validity								
Internal			X	X	X	X		
External			X	X	X		X	
Construct	Face criterion ---------- Predictive criterion	X	X	X --------- X				
Reliability		X	X	X				X
Internal					X			
External					X			

3.5 Literature review

Literature in this context is what´s already known relevant for the research project (Robson, 2011). This is important in order get a perception of which knowledge already exists within the research field (Bryman & Bell, 2015). A literature review is described as identifying, locating and analysing information related to the research problem (Robson, 2011). It´s recommendable to be aware of what´s already known within the research problem to develop new research. Instead of repeating already existing research (Starrin & Renck, 1996).
Bryman & Bell (2015) distinguishes two different ways of doing literature review, systematic and narrative literature review. The systematic literature review is an evidenced-based approach where the literature is scrutinized in an explicit way to minimize biases and skewness for the researcher. On the other hand, the narrative literature review is a more interpretive approach when it comes to contributing knowledge to a particular research field, focusing on human discourse rather than an accumulation of knowledge (Bryman & Bell, 2015).
This thesis is using an inductive approach where theory is the consequences of the research instead of being the base of it. This causes problems to define the terms describing the study field before data collection. When thereafter analysing the collected data, there will likely be changes in the theory or the literature, which requires more flexibility. This entails that a

narrative literature review is better suited for the qualitative researcher with an interpretive epistemology.

The literature used in this thesis was founded in the library of SLU and Uppsala University with guidance from the universities librarians and search engines. The publications were founded by searching in the following electronic databases; Google Scholar, Primo and Web of Science. The researcher has carefully selected literature and publications that have been reviewed by persons skilled in the art, also known as peer-review, to assure quality and trustworthiness. To find suitable publications some relevant keywords have been used, also different combinations of keywords have been used to reduce the number of results as seen in table 7.

Table 7. Keywords for literature review. Own modification.

Organic fertilizers	Organic farming
+ Efficiency	+ Nutrient balance
+ Pelletized	+ Rules
+ NPK	+ Certification
+ Price	+ Crop rotation

3.6 Data collection

The collected data used for this thesis contains a mixture of primary and secondary data. Primary data is characterized by data that the researcher collects and analyse on their own for example interviews and observations (Robson, 2011). This kind of data is up to date and the researcher can customize it to reach the aim and the research questions (Hox & Boejje, 2005). Furthermore, the researcher knows the information is reliable since he is the one collected and structured it. On the other hand, primary data usually requires more time to collect and require knowledge of the researcher to manage the process (Hox & Boejje, 2005). Secondary data is information already existing usually collected by other researchers such as literature and publications (Bryman & Bell, 2015). This type of data is time efficient and creates greater scope for comparisons. On the other hand, secondary data is not customized for the research. There are also risks for secondary data to be old and thereby outdated for the research (Hox & Boejje, 2005).

This thesis is using a mix of primary and secondary data since their strengths and weaknesses are the opposite and thereby complement each other. The empirical study in this thesis is mainly based on primary data, above all interviews and is complemented or attested with secondary data especially literature and publications.

Both Robson (2011) and Yin (2009) argues for the importance of using multiple sources when doing research, which is the key to data triangulation. Yin (2009) divides sources of evidence into six different categories; documentation, archival records, interviews, direct observations,

participant observations and physical artefacts. The collected data used for this thesis empirical study consist of documentation such as personal documents achieved from Lantmännen. It also contains archival records in terms of statistical data from the state authority, the Swedish Board of Agriculture. Documents and archival records are stable and can be reviewed repeatedly and usually cover a long span of time including many events (Yin, 2009). On the other hand, those sources of evidence can be difficult to find and could be biased selectivity if the collection is incomplete (Yin, 2009). However, the main data in this thesis is collected by interviews, probably the most widely used methodology in qualitative research (Bryman & Bell, 2015). Those interviews consist of four organic farmers considering organic fertilizers, focusing on if they use it or not and furthermore if they have a demand for it. Qualitative interviews can vary in terms of how the researcher chooses to tackle them (Robson, 2011). Qualitative interviews are divided into two main types of interviews; unstructured or semi-structured (Bryman & Bell, 2015). In this study, the unstructured interview will be the more appropriate type, since the researcher strives for being as little involved in the interview material as possible. Instead, the researcher purposes to perceive and interpret feelings and arguments of the interviewee as flexible as possible (Robson, 2011).

When using unstructured interviews, the researcher asks only one or maybe a few questions, the interview then takes shape based on what the interviewee answers. (Bryman & Bell, 2015). The interviewer's goal is to have the respondents to speak freely and to be aware of that the interviewer's behaviour has an impact on this, but also to have as little of an impact as possible. This requires an interviewer that listen more then they talk and ask clear questions that doesn't get the respondent confused or defensive. Since the interview can sometimes take shape of a regular conversation, it's important for the researcher to be aware of what role they have in that conversation, but also to be well prepared and sensitive to different uses of language as well as sector specific expressions (Robson, 2011).

This thesis will not only interview the customer side but also the producers in order to get both sides opinion and thereby get a more impartial and larger picture of the study. There will be interviews with capable and knowingness people from Lantmännen and Gyllebo, suited for the questions. Those people will be interviewed as a group, known as focus groups. According to Bryman & Bell (2015), focus groups have for many years been significant for market research, which is what this study is about and will thereby probably be an applicable method. When arranging focus groups, the researcher interviews several people at the same time within a question formulation or theme (Robson, 2011). The researcher is interested in how participants in a group are acting and discussing a question. The researcher is thereby able to get knowledge about how the participants react to each other´s opinions and how they are interacting as a group (Bryman & Bell, 2015). Trost (2010) claims focus groups for being complicated since the ones used to speak usually drown out the ones who are more silent. Furthermore, there´s a risk that the participants affect each other, resulting in majority opinions. Focus groups also require efforts from the researcher or in this case moderator, who needs to control neither the group nor him, is taking over the process (Bryman & Bell, 2015).

3.7 Ethical considerations

For any researcher, especially the ones doing research involving people, it should be obvious to be aware of ethical considerations. There is a risk of harm, stress, anxiety or other negative consequences for research participants (Robson, 2011). To avoid those negative consequences, Kvale & Brinkmann (2009) mention four requirements that need to be

considered; informed consent, the role of the researcher, confidentiality and the consequences of the study. Furthermore, Bryman & Bell (2015) explains how the mentioned requirements could be fulfilled. The interviewer should inform the respondent about the purpose of the study, clarifying the respondent´s voluntary participation and their rights to cancel whenever they want. If the respondents wish, their identities should be anonymous, and they should be aware of the consequences if they choose to not be anonymous. Finally, the researcher must clarify for the respondents to what extent the collected data will be used (Bryman & Bell, 2015).

4 The empirical study

The following chapter gives an introduction of the interviewed farmers to give the reader an understanding of the conditions of the farmers´ businesses. Thereafter follows a compilation of the farmers´ views based on the theoretical theme and aim of the study. The information collected from the interviews form the basis of the analysis and discussion in the next chapter.

4.1 Presentation of the interviewed farmer's businesses

Farmer A is placed in Östergötland. The company holds 210 hectares organic arable land and has livestock of 58 cattle corresponding to 3 654 kg N. The company uses all of the manure for fertilizing the crops. Of farmer A´s arable land 30 % consists of legumes and grasslands that fix nitrogen, why there is no need for fertilization in these areas. The farmer also buys around 200 tons of poultry manure from a neighbouring farmer containing 2 340 kg nitrogen. Finally, the farmer buys 25 tons of Biofer from Lantmännen which equals to 2 500 kg nitrogen. Farmer A´s total nitrogen supply is 8 494 kg spread over 147 hectares giving a nitrogen dose of 57 kg N/ha.

Farmer B is placed in Östergötland. The company holds 180 hectares organic land and has 24 000 organic laying hens corresponding to 13 000 kg N. The manure is enough for fertilizing all the farmers areal and he´s selling the surpluses of 5 000 kg N to neighbouring farmers. Of farmer B´s arable land 40 hectares consists of legumes and grasslands, which doesn't get any extra nitrogen due to the nitrogen fixation. He buys 3 tons of Biofer for his smallest fields, which equals to 300 kg N. Farmer B´s total nitrogen supply is 8 300 spread over140 hectare giving a nitrogen dose of 60 kg N/ ha

Farmer C is placed in Östergötland. The company holds 100 hectares organic arable land and has a livestock of 40, corresponding to 2 520 kg nitrogen. The company uses all the manure for fertilizing the crops. The farmer furthermore buys around 1 000 m3 of liquid manure from cattle containing 4 300 kg N. The farmer also buys 40 tons of Ekoväx which contain 3 600 kg N. Farmer C´s total nitrogen supply is 10 420 kg spread over 100 hectares giving a nitrogen dose of 104 kg N/ ha.

Farmer D is placed in Östergötland closed to A and B. The company holds 200 hectares of organic arable land and has livestock of 40 young cattle corresponding 1 600 kg nitrogen. The farmer also buys 30 tons Ekoväxt corresponding with 2 700 kg nitrogen. 50 % of the land consists of legumes and grasslands which doesn't get any extra nitrogen. Farmer D `s total nitrogen is 4 300 kg, spread over 100 hectares, resulting in a dose of 43 kg N/ha.

4.2 How the farmers provide the arable land with Nitrogen

Farmer A is dissatisfied with the current nutrient supply, he is spreading 50 kg N/ ha on the crops and 0 kg N/ha on the grasslands. Farmer A explains that the desirable nitrogen dose would be doubled." *I need to prioritize the crops with the best contribution margin*". His cash crop is rape seed where the farmer thinks it´s motivated to use Biofer. On the grasslands, the farmer believes the contribution margin is too small, why Biofer is not motivated, besides the grasslands are able to fix nitrogen from the atmosphere.

Farmer A is buying 25 tonnes of Biofer as seen in table 8, to make sure all crops are provided with nutrients. Farmer A is satisfied with Biofer and would like to buy more of the product but holding back due to several factors. Farmer A claims that the cereal prices control the number of inputs. Furthermore, he mentioned that the number of inputs he wants to get back in output which is dependent on the price, quantity and quality.

Farmer A thinks that an advantage with Biofer is that it could be seeded simultaneously as the fertilization, using the same machine. By this method, the farmer saves another machine operation and thereby saves both time and money. While simultaneously fertilizing and seeding, the fertilizer is also mulched directly which utilize the uptake of nutrient. The autumn sown crops are according to farmer A harder to fertilize with Biofer in the spring because there's no good machine to mould the fertilizers without damaging the crop. If Biofer is spread over the crop it´s not utilized effectively. Farmer A says that he would buy another 25 tonnes of Biofer for the autumn crops if it weren´t for the issues using it effectively.

Farmer B, who is the only farmer that has surpluses of manure, is selling 5 000 kg N to neighbouring farmers. Despite this, he is still buying 3 tonnes of Biofer. He said that the only way to fertilize his small fields is by organic fertilizers since the spreaders are small and flexible. It´s not possible to operate those fields with a modern manure spreader, which is much larger than the ones used for organic fertilizers. The heavy manure spreader has according to farmer B, a great negative impact on the yield due to the soil compaction, which is reduced by the lighter spreaders for organic fertilizers. Farmer B says there are better yields on the small fields that are spread with Biofer than the larger fields spread with manure. This is according to the famer a result of soil compaction from the heavy manure spreader since whether he spread Biofer or manure the dose of nitrogen is the same.

Farmer C buys the organic fertilizer Ekoväx due to lack of manure. Farmer C thinks that organic fertilizers are too slow in releasing nitrogen. The nitrogen must mineralize fast to make sure the crops are coming up as fast as possible. The organic fertilizers are mineralized by the crops around four weeks after fertilized, which mean you should fertilize it 3-4 weeks before sowing. It´s problematic because at that time you won´t run the fields with machines since it´s too early. He would buy more if there were choices of different products from fast-acting to slow released nitrogen. "*Then you can choose what´s most needed for the crops at the time*". Or maybe even better a product with 50 % slow released nitrogen and 50 % fast-acting nitrogen. He said: "*It would be optimal then the crops would use the fast-acting nitrogen in the autumn and the slow released in the spring"*

Farmer D describes that nutrient supply is the most challenging mission on the farm.
Last year the farmer shut down the dairy business and switched to bovine animals. The famer hasn´t yet built up as large livestock as desired. At the moment, the livestock consists of 40 young cattle. The cowshed can take up to 80 cattle, which is what the farmer is aiming to have. The farmer has tried to buy farmyard manure from neighbouring farmers, but most of the farmers in the area are organic and has the same problem as farmer D and thereby need it for themselves. The farmer thinks it´s problematic that there´s one inorganic neighbouring farmer with an excess of farmyard manure from slaughter chickens. This kind of inorganic manure is not allowed for organic farming. "*It`s inconsistent that some inorganic manure is approved for organic farming and some are not*".

For farmer D it´s essential to have as many legumes and grasslands as possible due to the lack of farmyard manure. The farmer buys Ekoväx, which is an organic fertilizer that competes

with Biofer. Farmer D buys Ekoväx due to the lack of farmyard manure. According to farmer D, organic fertilizers are the third choice; he would prefer being self-sufficient in farmyard manure and as second choice to buy from a neighbouring farmer. The farmer could furthermore buy farmyard manure from farmers further away but doesn´t think it´s worth to pay too much for transportation for a product which contains much water. "*There´s no point in paying shipping costs for water, it´s also unnecessary due to soil compaction to drive around with water*."

Farmer D finally concluded that he had to buy organic fertilizer. The choice of Ekoväx instead of Biofer was, according to farmer D, due to better information about the product, cheaper nitrogen per kilogram and because he rather wants to support the small producers. He furthermore likes the idea that Ekoväx is manufacturing and selling the organic fertilizer without any intermediaries. The amount of Ekoväx was based on the cereal prices *"If the cereal prices would increase I would be able to increase costs for inputs. For the moment, I buy as many inputs as is motivated by the cereal prices"*

Table 8. Summary of how the different farmers are providing their crops with nutrients. Own modification.

	Own Manure (kg N)	Bought manure (kg N)	Bifoer (kg N)	Ekoväx (kg N)	Total (kg N)	Total areal (ha)	Areal not fertilized due to nitrogen-fixing crops (ha)	Nitrogen dose per hectare (kg N/ha)
Farmer A	3 654	2 340	2 500	0	8 494	210	63	57
Farmer B	8 000	0	300	0	8 300	180	40	60
Farmer C	2 520	4 300	0	3 600	0	100	0	104
Farmer D	1 600	0	0	2 700	4 300	200	100	43

4.3 The farmers´ buying decision-making process and factors affecting it

Buyclass

All the farmers have some experience of buying organic fertilizers, but also a need to modify the current process; hence they belong to the modified rebuy buyclass. Farmer A thought it was problematic that organic fertilizers should be mulched to achieve a better result. The spring sown crops are thereby hard to fertilize in the autumn because it´s not possible to cultivate the fertilizer without damaging the crops. Farmer B furthermore describes that Biofer is taken up by the plants quite slowly, he would buy more if there were choices of

different products from fast-acting to slow released nitrogen. Then the farmer can choose what´s most needed for the crops at the time. Another idea from farmer B was a product with 50 % slowly released nitrogen and 50 % fast-acting nitrogen. It would be optimal because the crops would use the fast-acting nitrogen in the autumn and the slow release in the spring. Those thoughts could be valuable for Lantmännen in terms of the potential product. Furthermore, it could lead to a tougher competition if also competitors are trying to modify the product to gain new businesses.

Problem or need recognition

All the farmers except farmer B mentioned that the supply of nutrients is one of the most challenging problems within their businesses. This is furthermore revealed in table 8, showing that farmer B is the only farmer with surpluses of nitrogen. The other farmers, lacking nitrogen, consequently need to get nutrients elsewhere. There are two options researched in this thesis to achieve that; either to buy manure or organic fertilizers. Since manure is cheaper the farmers are at first-hand look for manure to buy, but many farmers lack manure and consequently want to buy rather than sell. There is also a political aspect as an underlying factor. As Farmer D pointed out, it´s inconsistent that some inorganic manure is approved for organic farming and some are not. This makes it hard to buy manure which leads to the other option; buying organic fertilizers. The farmers buying organic fertilizer also need to handle another choice, whether to buy Biofer or Ekoväx. All farmers need a source of nitrogen in order to grow grains, hence it´s also an underlying economic aspect in need of recognition.

General need description

The general need description is given in table 9, showing that substitute products are the determining factor. Furthermore, the prices of those substitute products determine which one is preferred, hence there is also a matter of economic conditions. In chapter 5.1 the researcher will analyse the background of the farmers´ general need description.

Specification of the product

All the farmers think Biofer is a good product, especially because of the high content of nitrogen compared to the weight. This facilitates and rationalizes all transport compared to manure both outside and on the field. Even farmer B who is the only farmer who has surpluses of manure buys the product. He said that the only way to fertilize his small fields is by organic fertilizers since the spreaders are small and flexible. It´s not possible to operate those fields with a modern manure spreader, which are much larger than the ones used for organic fertilizers. Farmer D mentioned that those smaller machines used for organic fertilizers also increase the yield in terms of reduced soil compaction. The organic fertilizers are lighter due to the content of high nitrogen and low water, which consequently makes the load of the spreader lighter. The heavy manure spreader has, according to farmer B, a great negative impact on the yield due to the soil compaction, which is reduced by spreading organic fertilizers. Another specification, according to the farmers, is that organic fertilizers can be spread simultaneously as the seeds, using the same machine. This saves money and time since it saves one operation using machines.

The results of the empirical study show that all the farmers agree on the fact that price supported by technology is the most significant specification of the product determining whether to buy Biofer or not. Furthermore, the farmers had different factors of the pricing

decisions as a reason for being limited to buy the product. The empirical results show that those limitations were mainly linked to the availability of manure, the competitor Ekoväx and cereal prices. All the farmers have access to manure, which serves as a substitute input of organic fertilizers. The farmers furthermore agreed on that the cereal prices control the amount of input. This was explained by the fact that higher cereal prices give bigger output and if the output increases they are willing to increase input.

Search for potential suppliers

The search for potential suppliers is not a complicated process since there are only two notable suppliers delivering organic fertilizers (Personal message, Wahlström, 2017). There are many other sources of nitrogen such as manure, digestate biogas, inorganic specialty fertilizers and animal by-products etc. This thesis is delimited to organic fertilizer, hence there are only two options for the farmers; Biofer or Ekoväx. The farmers know about the organic fertilizers from Gyllebo and Ekoväx thanks to newspapers, agricultural fairs and above all their local personal seller. The farmers also mentioned that their advisors recommend the use of organic fertilizers, which according to the farmers has a great impact on the decision. All the farmers were in contact with Lantmännen and Ekoväx and obtained proposals from both.

Evaluating proposals and selection of supplier

The farmers are at this stage deciding for which product and supplier that best covers their needs. The decision is based on which element or combinations of elements that is most crucial for their farming in relation to the price per quantity of the crucial elements. The farmers did not agree upon which supplier that delivered the cheapest nitrogen per kilogram, farmer A said it was Biofer and farmer D said it was Ekoväx. This could be explained by either misinterpretation of the farmers or salespersons straining the truth. Furthermore, farmer D for instance thought it was cheaper to buy from the smaller supplier Ekoväx. He believed they could have lower prices since they are manufacturing and selling their own products. Farmer A, on the other hand, thought that such a large supplier as Lantmännen could have the products available in greater occurrence within the country and thereby also probably could have lower delivery costs.

Two of the farmers chose Lantmännen as the supplier and the other two chose Ekoväx as the supplier. This witness that it´s a quite an even run among those two suppliers, indicating that it’s easy for one supplier to take most of the customers by modifying the product after customers’ needs. In chapter 5.3 the researcher will analyse the suppliers to understand what´s important for the farmers and what may be the reason for choosing one supplier before the other.

Selection of an order routine

The farmers start an order routine of the final order with the selected supplier. The order routine is based on meeting the farmers´ general need description and the product specification. In other words, it´s dependent on the same factors as the general description and the product specification altogether.

Feedback and post purchase evaluation

The farmers review the supplier, rating satisfaction with the supply. The satisfaction is based on all the previous buy phases, why this buy phase is a summary of the whole process. Finally, the overall impression decides whether the farmers will continue with a straight rebuy, further or the same unchanged modifications, or drop the supplier.

As a summary, the researcher is now able to integrate all theoretical framework used for this thesis. By integrating the theories of the factors affecting business decision making with the business buying decision-making process, it will appear what factors affect which buy phase as seen in table 9. From this, the researcher can analyse where in business buying decision process something is unmet and what or which factors it may depend on.

Table 9. Integration of theories. Own modification.

Buy phases	**Factors affecting business decision making**
1. Problem or need recognition	Political Economically
2. General need description	Economically Competition- Product substitute
3. Specification of the product	Technological Economically
4. Search for supplier, evaluating proposals and selecting supplier	Supplier Competition- Current Economically
5. Selection of an order routine	Economically Technological Competition-product substitute
6. Feedback and post purchase evaluation	Political Economically Technological Supplier Competition- Current Competition- Product substitute

As seen in table 9, the economic conditions affected the farmers' buying decision within all buy phases, making it the priority of analyse. Thanks to the interviews with the farmers the researcher has an overall understanding of the farmers´ buying decision process. Furthermore, the researcher has a full understanding of the problem or need recognition and the technology of product specification. On the other hand, the researcher does not have the whole picture of the general need description- how the product substitutes affect the farmers economically, neither does the researcher fully understand the matter of the economic aspects considering the specification of the product. Finally, the researcher lacks knowledge of the search and selecting supplier phase, when it comes to the competition among the suppliers. Those three are issues which the researcher wishes to get a deeper understanding of to contribute to a business and marketing understanding. When sorting those three issues out the researcher has an understanding for the whole buying decision process of the farmers, since the two last buy phases are given by the previous ones; the order routine is based on the general need description and the product specification and the feedback is based on all the previous buy

phases (Kotler, 2001). The mentioned issues will thereby be the basis for the analysis and discussion in the following chapter.

5 Analysis and discussion

This chapter will discuss the findings from the empirical study with consideration of the theoretical perspective. Finally, the findings in this chapter will be the basis of the conclusions in the next chapter.

This chapter aims to address the research questions stated in chapter one, based on the theoretical framework and the empirical data. The research question is the following:

Why doesn´t Lantmännen´s and farmers' trade of the organic fertilizer Biofer correspond with the increase of organic arable land?

The theoretical framework and empirical data have provided this study with the factors that affect the stages in buying decision-making process. In order to answer the research question stated above the researcher finally must understand how different factors are affecting the business buying decision-making process. The empirical study has already answered stage 1 in table 8; the problem or need recognition and which factors that affect it. Furthermore, stage 1 was discovered as a possibility of buying organic fertilizers rather than an obstacle. Stage 1 does thereby not contribute to the research question, why it will not be further analysed. Stage 5 and 6 in table 8 are given by previous stages; the order routine is based on the general need description and the product specification and the feedback is based on all the previous buy phases (Kotler, 2001). Henceforth, the remaining stages in table 8 are stage 2-4; general need description, specification of the product and search for supplier, evaluating proposals and selecting supplier. Those stages must be analysed in terms of how and why theoretical factors, except technological specifications, are affecting them. The technological factors proved in the empirical study to be an incentive to buy organic fertilizer rather than an obstacle. Thus, the technological factor does not answer the research question and does not need to be analysed further. When having those stages analysed in terms of how the theoretical factors affect the buying decision, the researcher will know how all factors affect the buying decision process and only then be able to draw the conclusion.

5.1 How the theoretical factors are affecting the general need description

This section will present how the product substitute and economic factors affects the general need description as seen from the extract of table 9 below.

Extract from table 9.

Buy phase	**Factors affecting business decision making**
2. General need description	Economically Competition- Product substitute

All the interviewed framers revealed that the demand of organic fertilizers is dependent on the supply of organic manure. Figure 5 shows the increase of organic livestock during the period between 2009-2015. For the full calculation, the reader is advised to see appendix 1.

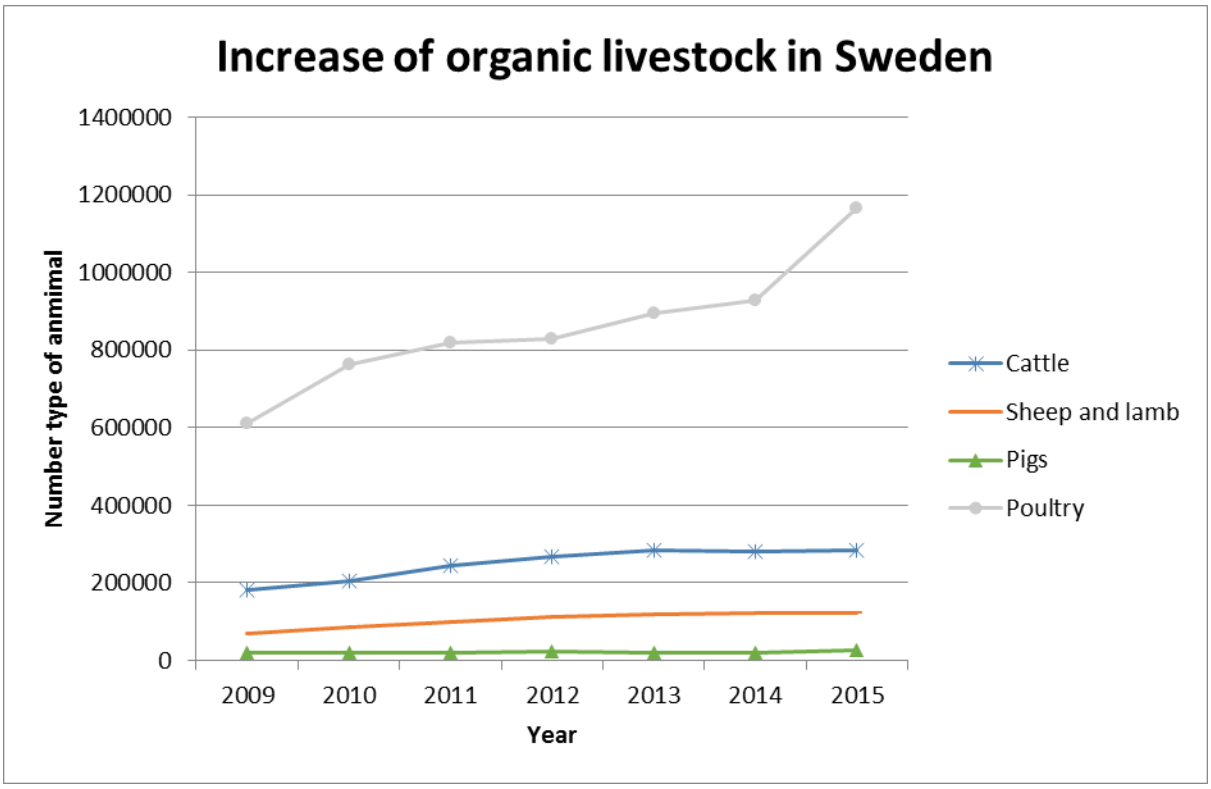

Figure 6. Increase of livestock in Sweden. Own calculations, full calculations available in appendix 1.

The increase of the organic livestock is not by itself relevant for this study, but with an increased livestock comes a larger supply of manure. The increased livestock in figure 6 has resulted in a larger supply of manure, which is shown in figure 7. Briefly, the transformation from figure 6 to 7 is made by multiplying the number of the livestock by the amount of nitrogen produced from every species. Finally, it´s multiplied by EU´s number of livestock units (LSU) which facilitates the aggregation of livestock from different ages and species (Internet, EC 1, 2017). For full calculations for figure 7 the reader is referred to appendix 1. The same calculations could be made for phosphorus and potassium. The researcher has chosen to only focus on nitrogen since it´s the most common element determining the dose of manure (Hansson, 2002).

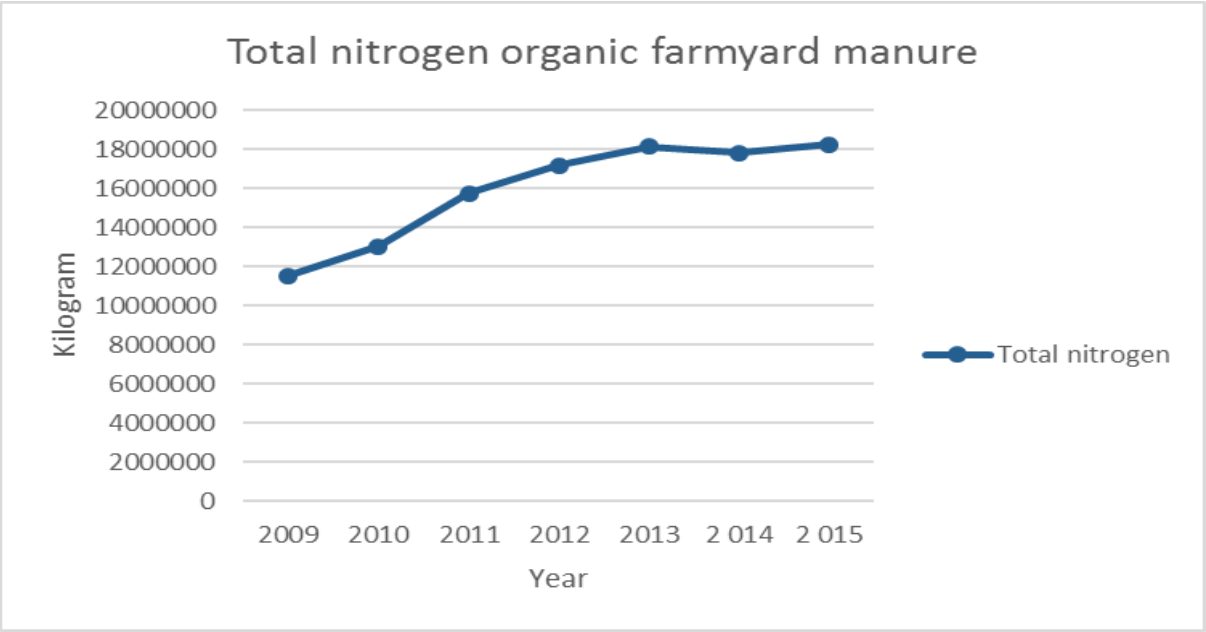

Figure 7. Increase of nitrogen from organic manure. Own calculations, full calculations available in appendix 1.

As shown in figure 7, the total Nitrogen supply from farmyard manure is in 2015 around 18 million kg Nitrogen, compared to Biofer which has a trade of around 90 thousand kg Nitrogen during the same year as shown in figure 2. The price of Biofer per kilogram Nitrogen is 37,5 SEK since it´s almost solely Biofer 10-3-1 that´s traded. Manure is hard to price since manure from different animals contains different amount of nutrients. Furthermore, the nutrients vary in importance for farmers in terms of what their crops is needed. According to Greppa Näringen (2012), a kilogram Nitrogen of manure is estimated at price of 11 SEK on average. Total cost for manure and Biofer is given by the equation 2.

$$C = M * Pm + B * Pb \qquad \textit{Equation 2}$$

*C = Cost
*M= quantity manure
*Pm = price manure
*B= quantity Biofer
*Pb= price Biofer

Using the mentioned numbers above in equation 2:

18 000 000 * 11 + 90 000 * 37,5 = 201 375 000

If all costs are linked to manure: 201 375 000/ 11 = 18 306 818
If all is costs are linked to Biofer. 201 375 000 /37,5 = 5 370 000

The two quotients above are the two intercepts of the isocost line (C1), which is shown in figure 8. An isocost line shows all combinations of inputs that cost the same total amount (Perloff, 2011). The isocost line is given by solving B from equation 2:

$$B = C/Pb - Pm/Pb * M \qquad \textit{Equation 3}$$

Plugging in the numbers in equation 2:

90 0000= 201 375 000/37,5 – 11/37,5 * 18 000 000= 90 000

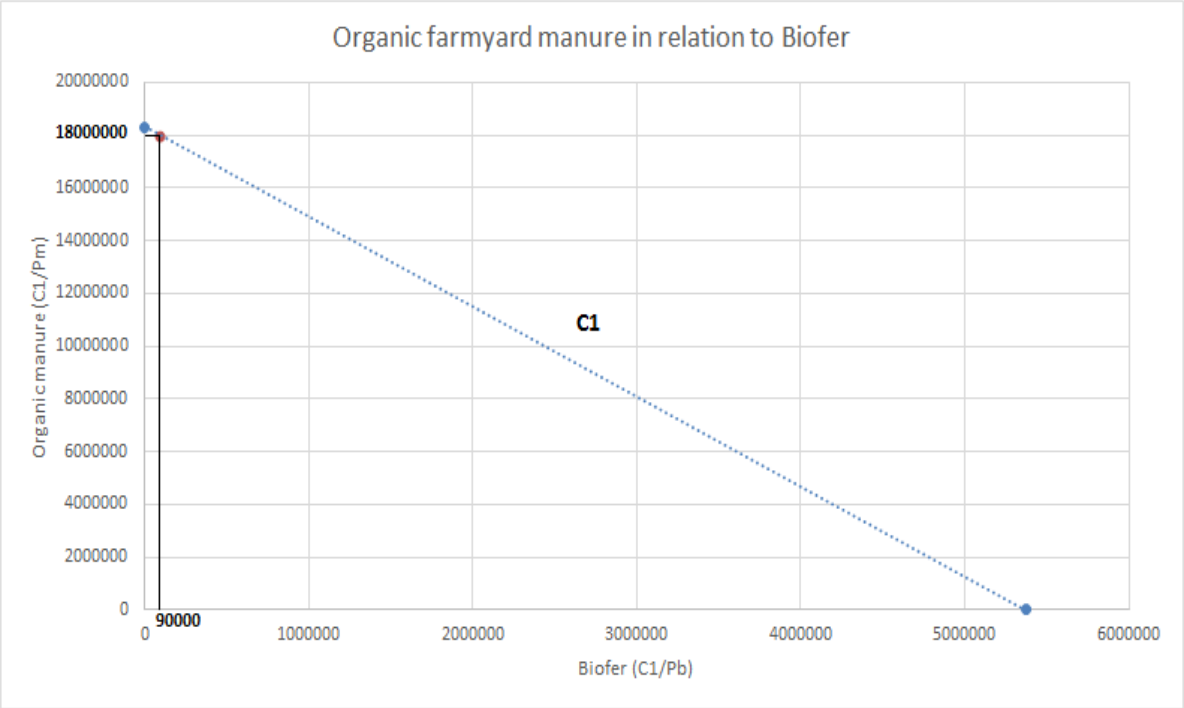

Figure 8. Relation between supply of organic manure and the increased organic arable land. Own calculations.

In 2015 there was around 18 million kg N of manure and the trade of Biofer was around 90 thousand kg N. Farmers are almost maximizing the input of manure, which is seen figure 8, it´s almost in line with the maximum on the y-axis representing manure. The x-axis, representing Biofer, which on the other hand, is very close to zero. This shows that farmers choose manure before Biofer, the reason is probably that livestock farmers have availability of manure at no additional cost.

If the price of Biofer would decrease by for example 10 SEK per kg/N the trade volumes would increase:

18 000 000 * 11 + B * 27,5= 201 375 000

B= 122 727

A decrease of 10 SEK per kg/N on Biofer would thus result in a larger traded volume from 90 000 Kg N to 122 727 Kg N.

Plant nutrient and the livestock keeping should be balanced in organic farming. Animals must primarily be fed with products made from the farm and the farmyard manure should principally be used on the farm's arable land (Internet, Jorbruksverket 2, 2017). The organic manure is thereby a part of the organic cycle and is available at no additional cost for farmers that have livestock. Biofer is not included in the organic cycle in the same way as organic manure and it also entails a higher cost than manure. It´s thereby hard for Biofer to compete

with manure, which is one of the reasons for Biofer having difficulties to increase on the market. Biofer having hard to compete with farmers having access to manure but is still interesting for farmers who lack manure or values the technological specifications higher than the price. The product substitute and its economic importance is the first factors hindering the farmers in the buying decision process. Consequently, this is part of the answer to the research question.

5.2 How the theoretical factors are affecting the specification of the product

This section will present how the economic factors affect the specification of the product as seen from the extract of table 9 below. The technological factor proved to be an incentive to buy organic fertilizer rather than a hinder. Thus, the technological factor doesn't answer the research question and doesn´t need to be analysed further.

Extract from table 9.

Buy phase	**Factors affecting business decision making**
3. Specification of the product	Technological – given from the empirical study Economically

All the farmers mentioned the economic factors as the most important specification of the product. The farmers thought the product is too expensive in relation to organic manure as described in chapter 5.1. Furthermore, the farmers mentioned the price of input in relation to the price of output as an affecting economic factor. Meaning that the prices of cereals are controlling the purchasing behaviour of the inputs. This factor will be the analysed topic in this section, to find out how it´s affecting the trade of Biofer and thereby answer the research question. The last economic affecting factor was the price of the competitors but since it doesn't affect this buy phase it will be analysed in chapter 5.3.

The prices of cereals have been increasing from 2009 to 2015, which is shown in figure 9, the cereal prices are revenue of the outputs for the farmers. Haas (1992) means that the sales or output of a company is the purchases or inputs of another company. If the company gets more output, they need more input delivered from the other company. The farmers agreed on the fact that if the prices of the cereals increase they would invest more on inputs to increase the output. The average cereal price has decreased from 2011 to 2015 as seen in figure 9. On the other hand, Biofer has increased during the same period as seen in figure 1, which would suggest that higher cereal prices don't automatically result in an increased trade of Biofer. This could be explained by as mentioned in chapter 5.2, that the supply of manure has increased as well and is accordingly the increased input. Another reason could be that the prices of Biofer have increased with the prices of cereal, i.e., costs increase with revenue and thereby not making the profit larger in percentage terms. A third reason could be that the prices have increased but the quantity has decreased, resulting in no increase in the output. However, the economic factors affecting the specification of the product is linked to the substitute product manure and the competitor Ekoväx and isn´t affected by the price of cereals. In contradiction to the empirical study, this prove that the cereal prices haven´t had any effect on the farmers´ buying decision of Biofer. Thereby the cereal prices are not part of the answer to the research question.

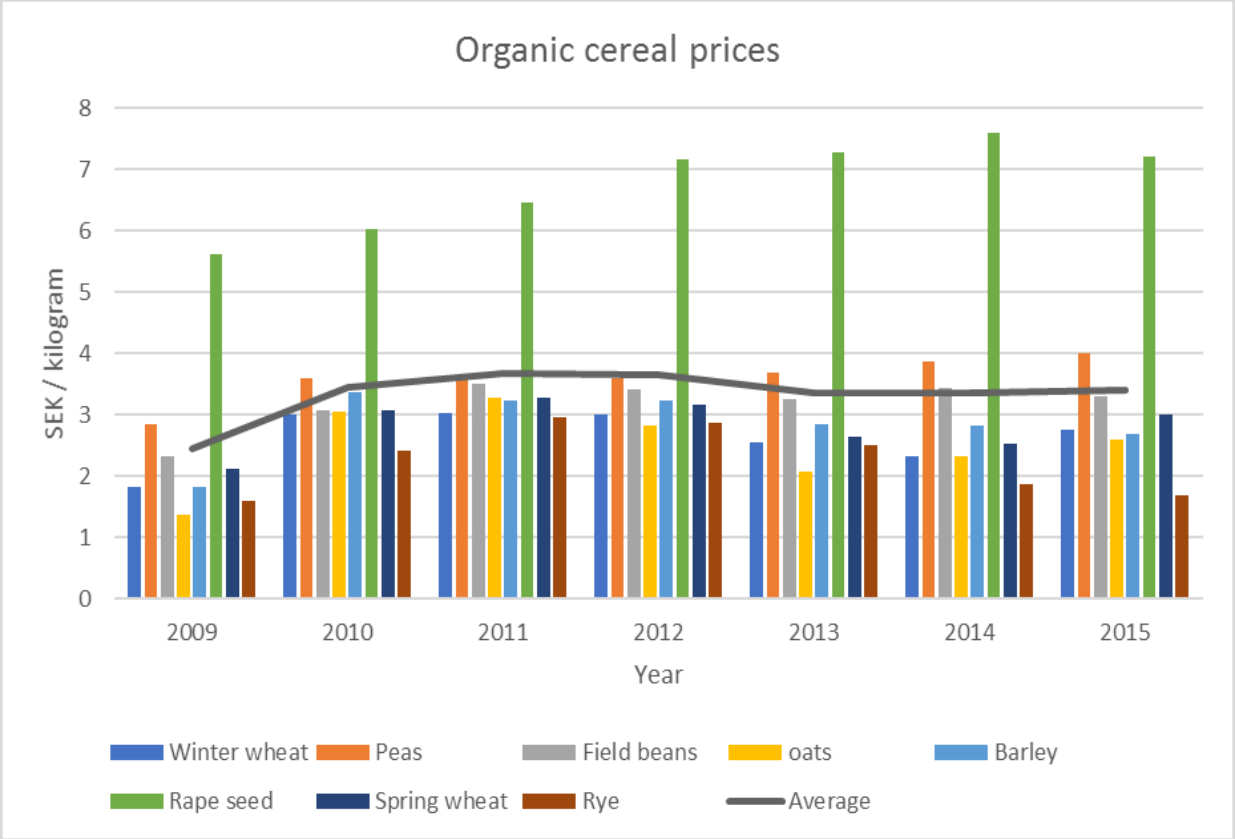

Figure 9. Price trend of organic cereals based on Lantmännen´s pool prices in pool 1. Own modification (Internet, Lantmannenlantbruk 3, 2017).

5.3 How the theoretical factors are affecting the search and selection of supplier

This section will present how the factors of; supplier, current competition and economic affect the buy phase of search for supplier, evaluating proposals and selecting supplier as seen from the extract of table 9 below.

Extract from table 9.

Buy phase	**Factors affecting business decision making**
4. Search for supplier, evaluating proposals and selecting supplier	Supplier Competition- Current Economically

At the moment, there are only two notable suppliers of organic fertilizers namely, Lantmännen delivering Biofer and Ekoväx delivering Ekogödsel (Personal message, Wahlström, 2017). Table 9 shows the content and the prices of the different products from Lantmännen and Ekoväx.

Table 10. Comparison of Lantmännen´s and Ekoväxt´s products considering content and prices. Own calculations based on (Jordbruksverket, 2016)

	Price/kg total	Nitrogen	Price/kg N	Phosphorus	Price/kg P	Potassium	Price/kg K	NPK	Price/kg NPK
Ekoväx									
Ekogödsel Plus 8-3-5-3	3,8	7,8%	48,7	3,2%	118,8	4,9%	77,6	15,9%	23,9
Ekogödsel Plus 6-3-8-5	3,05	5,9%	51,7	2,9%	105,2	7,6%	40,1	16,4%	18,6
Ekogödsel Plus 9-4-0	3,95	9,0%	43,9	4,1%	96,3	0,4%	987,5	13,5%	29,3
Ekogödsel Plus 4-1,5-2	2,1	4,4%	48,8	1,5%	140,0	2,4%	87,5	8,2%	25,6
Average	3,2	6,8%	48,3	2,9%	115	3,8%	272	13,5%	24,3
Gyllebo									
Bifoer 10-3-1	3,75	10,0%	37,5	2,6%	144,2	1,0%	375,0	13,6%	27,6
Bifoer 9-3-4+2	3,89	8,8%	44,2	2,5%	155,6	3,6%	108,1	14,9%	26,1
Bifoer 6-3-12+7	4,74	6,1%	77,7	2,4%	197,5	12,0%	39,5	20,5%	23,1
Average	4,1	8,3%	53,1	2,5%	165,8	5,5%	174,2	16,3%	25,6

From table 10 it´s possible to deduce the optimal choice for the farmer, this is dependent on which nutrients the farmer needs. If there's a need for all the elements together (NPK), the best price per kilo NPK is Ekogödsel Plus 6-3-8-5. If potassium (K) is the most important element the best product will be Biofer 6-3-12+7 since it has the lowest price per kilo K. Considering phosphorus, the best product is Ekogödsel Plus 9-4-0, because it has the lowest price per kilo P. However, this thesis is focused on nitrogen since it´s the element that´s needed in the largest amount and often the element that determine the fertilization dose (Hansson, 2002). The best product considering nitrogen is Biofer 10-3-1, which offer the lowest price per kilo N. The farmers´ decision when it comes to which supplier to choose is consequently dependent on which element or combinations of elements that is most crucial for their farming in relation to the prices. Furthermore, there are several other buying influences that aren´t part of the product itself that is of importance, mostly associated to the salespersons. The salespersons can arrange the specifications of the product in order to serve the requests of the customers (Haas, 1992). This thesis focusses on the product itself and does not intend to explain the matter of salespersons.

Table 10 shows that depending on which supplier and product the farmer chose will be affected economically. The current competition was shown in the empirical study that it´s affecting the trade of Biofer. Here, in the analysis, it´s shown why and how the choice of supplier in current competition is affecting the trade of Biofer. The choice of supplier in the current competition is thereby part of the answer to the research question.

6 Conclusions

This chapter discusses the achievement of the aim, resulting in this thesis' conclusions and contribution to existing research.

The aim of this study is to investigate why the trade of Lantmännen´s organic fertilizer Biofer does not correspond to the increase in the use of land for organic farming. To achieve the aim, the following research question is answered in this project:

Why doesn´t Lantmännen´s and farmers' trade of the organic fertilizer Biofer correspond with the increase of organic arable land?

Based on the theoretical framework and the empirical data, this study suggests that the aim will be found in the factors affecting the buying decision-making process of the farmers, as seen in table 8. However, the analysis and discussion display that stage 1, 5 and 6 are not contributing to reaching the aim.

In the analysis, stage 2 shows to be affecting the farmers economically in terms of competition from the product substitute manure, since plant nutrient and the livestock keeping should be balanced in organic farming. Biofer struggles to compete with manure since the product entails a higher cost and is not a part of the organic cycle. Therefore, the product has difficulties to increase on the market. Biofer is purchased by farmers who do not have enough supply of manure and have difficulties to find manure elsewhere. The supply of manure is not the only factor determining the trade of Biofer. The empirical study also reveals that the technological advantages linked to Biofer provide reasons to buy the product. Consequently, stage 2 is a part of the conclusion since it aids to reach the aim of this study.

In the empirical study, stage 3 appears to be discussing the aim but after the analysis the researcher concludes the opposite. Firstly, within the economic factor, it´s proven that cereal prices have no effect on the farmers´ buying decision of Biofer. Secondly, the technological factor is proved to be an incentive to buy organic fertilizer rather than an obstacle.

In stage 4 the farmers are affected economically depending on which supplier they choose in the current competition between Bifoer and Ekoväx. The farmers select supplier depending on which element or combinations of elements that are most crucial for their farming, in relation to the price per kilogram of the crucial elements. The farmers can´t agree upon which supplier that delivers the lowest prices of the crucial elements. The disagreements most likely base on the farmers´ own estimations, misinterpretation of the farmers or salespersons straining the truth or having different prices for different customers. Ekoväx is proven both in the empirical study as well as in the analysis to take market shares from Biofer. Thereby, the researcher concludes that stage 4 is discussing this study´s aim.

Table 11. Summary of conclusions. Own modification.

Buy phase	**Factors affecting business decision making**	**How it´s affecting the business decision making economically**
2. General need description	Economically	Competition- Product substitute
4. Search for supplier, evaluating proposals and selecting supplier	Economically	Supplier Competition- Current

Table 11 sums up the conclusions, where the aim is achieved through stage 2; the general need description and stage 4; Search for supplier, evaluating proposals and selecting supplier. The factors affecting the stages are economically related and depend on two different ways of competition. In stage 2, it´s concerning competition from the product substitute manure, which constitutes an obstacle in the sales of Biofer. Stage 4 concerns which supplier the farmers choose between Bifoer and Ekoväx in the current competition. The competitor Ekoväx is proven to take market shares from Biofer and thereby complicates the trade of Biofer.

Finally, this thesis shows that the production can increase without a corresponding increase of inputs, in contradiction to production theory and the production function. The thesis reveals that it depends on the economic factors in terms of product substitute and current competition. Even though it’s eventually affecting the farmers economically, the researcher argues that there are underlying aspects that causes this result. Aspects that this thesis theoretical framework couldn´t explain. The farmers operate in a market that has certain structures that the firm can´t influence. As been discussed in this thesis organic farming has a market structure that is focused on nutrient cycling. Conventional farming on the other hand, is more dependent on fertilizers than organic farming since the focus on nutrient cycling isn´t as characteristic. This proves that different production systems within the same branch differ due to market structures. Consequently, the researcher stresses the importance of structural changes in different production systems, since it seems to be excluded from existing production functions but still seems to affect them.

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Personal messages

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Marketing manager for commodities, Lanmännen
Personal meeting, telephone and e-mail

Appendix 1: Total nitrogen in total organic manure

Amount of converted organic animals 2009-2015

Antal omställda ekologiska djur. År 2009-2015							
	2009	2010	2011	2012	2013	2014	2015
00 Riket							
Kor för mjölkproduktion	32 519	36 435	44 727	47 843	48 193	46 902	47 652
Kor för uppfödning av kalvar	37 609	42 644	51 720	58 972	64 615	64 225	64 383
Kvigor, tjurar och stutar	54 618	63 512	74 070	78 480	87 255	83 822	87 449
Kalvar, under 1 år	56 166	61 402	73 929	82 591	85 607	86 371	86 290
Baggar och tackor	31 631	39 795	45 350	53 110	56 890	57 929	58 284
Lamm	36 893	47 761	52 381	60 160	61 870	63 738	63 593
Galtar för avel	35	37	36	57	51	54	58
Suggor för avel	1 861	1 919	1 758	2 017	1 996	1 904	2 729
Slaktsvin, 20 kg och däröver	13 106	12 727	12 359	15 451	13 520	13 082	17 456
Smågrisar, under 20 kg	5 717	5 159	4 792	4 456	4 981	4 626	6 496
Höns	579 015	730 421	790 224	798 936	868 378	900 002	1 114 159
Slaktkycklingar	31 100	32 000	29 400	29 342	26 014	28 599	52 410

Content of nutrients in manure, Kg/animals and year

Djurslag	Innehåll av växtnäring (kg/djurplats och år)		
	N	P	K
Mjölkko, 8 000 kg ECM[a]/år	132	15,2	114
Mjölkko, 10 000 kg ECM[a]/år	142	16,5	106
Mjölkko, 12 000 kg ECM[a]/år	178	21,0	117
Diko, helår	63	12	75
Diko, enbart stallperiod 6 mån	22	5	28
Kviga/stut <1 år	21	3	26
Kviga/stut >1 år	47	8	54
Gödtjur 1-12 mån	32	6	15
Vallfodertjur 1-16 mån	36	6	33
Betestjur 1-18 mån	40	6	46
Sugga, 2,2 omg/år (inkl. 23 smågrisar till 30 kg)	35	6,7[b]	13
Slaktsvin, 3,0 omg/år	10	1,6[b]	4
Värphöns 100 st	52	13[b]	17
Unghöns 100 st, 2,2 omg/år	22	6[b]	6
Slaktkyckling 100 st, 7,0 omg/år	28	6[b]	11
Kalkon 100 st, 2,3 omg/år (medeltal av stora och små)	69	24	31
Häst, fritid (500 kg)	48	9	58
Häst, ponny (300 kg)	33	6,4	42
Får inkl. 1,8 lamm	14	2	19

Amount of converted animals multiplied by nutrient content, Kg/animals and year

	2009	2010	2011	2012	2013	2 014	2 015
Mjölkko	4617698	5173770	6351234	6793706	6843406	6 660 084	6 766 584
Diko	2369367	2686572	3258360	3715236	4070745	4 046 175	4 056 129
Kviga, stut > 1 år	2567046	2985064	3481290	3688560	4100985	3 939 634	4 110 103
Kviga, stut < 1 år	1179486	1179486	1552509	1734411	1797747	1 813 791	1 812 090
Får inkl. 1,8 lamm	442834	557130	634900	743540	796460	811 006	815 976
Sugga 2,2 omg/år (inkl. 23 smågrisar till 30 kg)	30163,64	31118,18	28540,91	32995,45455	32565,91	31 150	44 339
Slaktsvin, 3 omg/år	43686,67	42423,33	41196,67	51503,33333	45066,67	43 607	58 187
Värphöns 100 st	301087,8	379818,9	410916,5	415446,72	451556,6	468 001	579 363
slaktkycklingar 100 st, 7 omg/år	1244	1280	1176	1173,68	1040,56	1 144	2 096
Total N	11552613	13036662	15760123	17176572,19	18139573	17 814 592	18 244 866