



Post Doctoral Research

${\bf Agriculture\ Machines-Design-Sustainability}$

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Post Doctorate Ressearch

University of Wuppertal Indrustrial Design Course.

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"To achieve great things, it is necessary not only to plan, but also to believe; Not only acting but also dreaming"

Anatole France





Being competitive in the production of food, using agricultural machinery with up-todate technologies and design, adjusted to the standards of international sustainability and serving customers, does not depend on the size of the company. It depends upon the awareness of the importance of defining the performance space that wants to be conquered in the market. Therefore, every agricultural machinery company needs to define the way it wants to be seen and remembered by its clients, which means the whole company being involved in the mechanization of agribusiness needs, in order to have a position in the market in which it is inserted. The present work aims to identify, based on the German company KRONE and Brazilian companies producing agricultural machines, the variables or positioning indicators that influence the decision making of farmers in the acquisition of high value agricultural machinery, guaranteeing design, sustainability and productivity. These variables can be used by companies to carry out the process of transferring technological innovations, aiming to increase or maintain their market share, by narrowing relations between agricultural producers and companies. The established positioning variables refer to farmers of greater perception when choosing a machine for a given crop. Thus, the relevant technical and / or behavioral factors that influence decision making at the time of purchase by food producers are identified. Through interviews with KRONE's business team and opinion formers in agribusiness, the motivations, perceptions, experiences, behaviors and intentions that directly interfere on the decision-making process are analyzed, and position variables are considered in this study. Knowing more about what and how their customers think, companies can improve their market position. For this reason, a new program for FGV was developed: Sustainability Machinery - Design. To get to know the Brazilian Market, 300 Brazilian Companies producing agricultural machines were interviewed. Companies are supposed to serve as partners in the new discipline, because they benefit from that. Furthermore, the concern with the proper design and sustainability of our world, takes a prominent place in the positioning variables.

Keywords: Positioning, Differentiation, Perception, Design, Agricultural machinery, Sustainability





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1 INTRODUCTION

The orientation to work, motivated by identifying the evolution of the design in the construction of agricultural machinery and the identified sustainability, is based on the concept of strategic agribusiness, when seeking from the manufacturers of agricultural machinery the direction of their actions. Strategic agribusiness, aimed at automating food production and capturing market perceptions, seeks to transform them into competitive advantages. To do so, externally captured information must return to the market as an innovation that can be understood (TROUT, 2005). As a result, the concept of positioning is used by strategic agribusiness to improve the insertion of products and services in the market through the perception of value by the customers (Hooleey, Sanders and PIERCY, 2001).

By working at FGV agribusiness, we identified that companies need to evaluate their products and services objectively and thereby understand how they are viewed by customers. Positioning itself in the agribusiness market, means thinking from the outside, to the inside (TROUT, 2005). Compared to any other segment of the market, agribusiness is embedded in an environment of constant and rapid changes, in which creativity and the ability to innovate (both in the development of technologies, in new products, in the transfer of these or in the way of relating to their customers) become competitive advantages.

These advantages can define the space of action of a company or organization in the agribusiness market. By properly using information from the market, a company will be able to perform an excellent and differentiated job for the insertion of new agricultural machinery, and this will allow the construction of a position consistent with what the market is asking for. Which means, positioning itself as expected by customers. Competitive positioning is an institutional learning process and, therefore, devoting time to researching trends and market scenarios is of paramount importance to agribusiness automation companies. (RIES and TROUT, 2002).

The methodological implementation of a system of evaluation and characterization of the market is crucial for any company's survival in the competitive market, both pre-and post-sale. The search for information about customers' feelings, motivations and perceptions regarding the products and services provided, constitutes an extremely valuable activity for the closer relationship between client and company. Only then will a correct positioning of the





products be possible and, consequently, the company will make them available to the market (HOOLEY, SAUNDERS and PIERCY, 2001; RIES and TROUT, 2002).

2 PURPOSE OF THE WORK

The purpose of the study is to identify agricultural production, users design, agricultural machines and sustainability. The first part deals with the existing agricultural business (or "inside the gate") representing farmers, whether small, medium or large producers, made in the form of individuals (farmers or peasants) or legal entities (companies).

The Brazilian agribusiness—through grain production—pushed the physical boundaries of the property, showing all its growth potential and investment needs, which turns into a real investment opportunity in this sector. Brazil is increasingly dependent on inputs. There are different agents in the production process, including the farmer, in a permanent negotiation between quantities and prices. Agribusiness as the sum of production and distribution of agricultural supply operations, production operations on the property, storage, processing and distribution of agricultural products and items produced from them.

The machining is done to lower the cost of production. The use of electronic, computerized or not, in land vehicles, naval and air, including from sensors (electronic, electrochemical and electro-mechanical) is electronically embedded. The embedded electronic term is therefore applied to all electronic devices and their peripherals, installed in vehicles and mobile machinery, as well as those fixtures that provide support for the embedded.

Thus, the electronic device is one in which all the driving of information is primarily by electrons moving through a vacuum, gas or semiconductor, in one of the many tools of the digital age.

It should do the job without great expense and with the least possible damage to plants. The alignment of research to technological development applied to agribusiness, integrating the use of electronic devices on tractors and harvesters is not new. The onboard electronics on tractors and harvesters have become common in developed nations. With the advent of integrated circuits and more recently of microprocessors, it became feasible to develop electronic circuits, cost and reliability compatible with its use in agricultural machinery.





In the FGV academic environment, there is a great lack of training students with the ability to lead change and interaction between design, machinery and agricultural sustainability. There is a lack of students able to mobilize their teams, focusing on organizational objectives and become competent enough to make their organizations competitive, volatile and susceptible to pressure from changing technology, contemporary issues and a traditionally paternalistic economy, dependent on the state..

Wuppertal University has shown interest in supporting the formation of thinkers in design, compatible with the codes of sustainability and its environmental, social and economic responsibilities, with identified interests in the Brazilian academic environment. The German and Brazilian cultures, developed with a focus on values of citizenship and future prospects, prioritize the emphasis on a national project capable of creating objective conditions, to enable the participation of various segments of society aligned with the international competitiveness of agribusiness.

Krone—which has a reputation in producing high quality products with excellent functionality, durability and long living and international respectability and longevity since 1902—sets the main reference for identifying compatibility between design and embedded ultimate technology in agricultural machinery. The company, chosen as a "case study," has been a part of the Agribusiness in Brazil since 2012, and has been in other 63 countries since it was founded in 1902.

Before presenting the company, we need to understand the division that this sector establishes in the great players of the agricultural chain. In broad lines, we have:

- a) Manufacturer of Inputs
- b) Suppliers of Machinery and Equipment
- c) Seed Suppliers
- d) Defensive Suppliers
- e) Suppliers of Macro Fertilizers
- f) Suppliers of Special Fertilizers
- g) Distributors
- h) Cooperatives
- i) Farmers
- j) Traders
- k) Final customers





In schematic, by commercial order, we have:

- a) The Manufacturer of agricultural machinery, which may be Brazilian or located in another country
- b) The Distribution Centers representing Suppliers
- c) The Distributor representing the Cooperative and Distributors
- d) The Trader can exist between the Producer and the Consumer on each market
- e) The company operates in the "production of high performance agricultural machinery" according image 1.



Image1- Agricultural Machinery

Source: Krone Group, 2016.

2.1 KRONE AND FGV- BERGISCHE UNIVERISTY WUPPERTAL

Since its founding in 1902 in the city of Spelle, Germany, its strategy is based on attributes that define it as a company of high value for the client, positioning itself with the objective of being a reference of quality and professionalism in the sector of High-performance agricultural machinery and technology.

2.1.1 Connecting innovation: Krone and FGV

At FGV Agribusiness we are aware of the need to promote more productive, ecological and sustainable agriculture. To this end, our academic innovation is based on offering our students academic solutions to increase their scientific production, to better qualify the results of Brazilian agribusiness. The intention is to produce more with less,





increasing their efficiency, favoring sustainable growth and finally guaranteeing protection for investments and efforts in the man-machine relationship.

Our team of teachers from FGV Agribusiness works closely with our students to identify their needs at all times. We are pleased to hear from our students and offer solutions that cater to their specific needs in the labor market.

2.1.2 Connecting quality: Krone and FGV

Our work aims at the satisfaction of the student and community of entrepreneurs, when using the FGV agribusiness as a reference in the search for information and strategic support. Consequently, we work on the development and production of highly efficient products for society, and offer a service of excellence that begins with the identification of the needs of students and ends with the achievement of good results for all those involved in the processes of learning and spreading information.

2.1.3 Academic partners FGV and Wuppertal University

One of the key values of differentiation is our staff teachers, researchers and students. It is built up by professionals from different cultures, with the ability to offer locally to each agribusiness client throughout the Brazilian territory, the technical knowledge in Bergische University, Wupeprtal, for each culture, bringing a high value proposal integrated, customized and always present.

2.1.4 Sustainability at FGV

The FGV is dedicated to respect for human and labor rights, the conservation of the environment and the sustainability of natural resources. Our top priorities include respect for REACH regulation, and using the principles of the United Nations Global Compact. The priority of the FGV is to stimulate in Brazilian society the production and diffusion of organic products. We are members of Global gap as part of our commitment to the environment and best practices in agriculture.





2.1.5 Krone with Bergische Wuppertal University

Contacts with Krone occurred in different occasions. The contact with the company began in Brazil with a Krone-accredited representative who, after meeting the purpose of the research and consulting their professional references in company headquarters, arranged the schedule of visits and initial questioning at the headquarters of the company. This meeting took place on October 7th, 2015 and February 15th, 2016, along with Carlos Alberto Decotelli da Silva, Dr. Siegfried Maser and Dr. Brigitte Edith Ursula Wolf. The receptivity in Spelle, KRONE was shared simultaneously by Director Dr. Josef Horstmann, Sr. Rafael Bouwman and Sr. Enric Calzada Pocielloof research, development and technological innovation. The master, Commercial Manager for all of South America, detailed in the technical visit at the premises of the factory, all phases and strategic fundamentals pertaining to each of the activities.

The interviews were based on dialogues with the two Representatives of Kronefor the understanding of the philosophy and the company's criteria for notice in design coupled to sustainability, competitiveness and commercial paradigm for best value identity for active brands worldwide.

The works were based on the company's activity in Krone Brazil and headquarters in Spelle, considering the highlighting and relevance of Brazilian agribusiness in the generation of wealth in the Brazilian economy and the ability to produce food for the whole world.

Table 1 shows the interview conducted with the Krone board of directors.

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KRONE PREMOS 5000-Krone-Landwirtschaft



Table 1- Overview on the interview with the management of KRONE (Spelle, Germany)

ANSWER

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DESCRIPTIONS	YES	NO	HIGH	MEDIUM	LOW
Does your company have a Design Department /DiD?		X	ı		
In which hierarchical level is the Department of Design?		X			
Does your company outsource the activity of Design / DiD?		X			
Does your company establish what to outsource and what to develop internally?	X				
Do designers and engineers work together in the production process / delivery?		X			
Does the Department of Design / DiD take part in the market strategy of the company?		X			
Does the Department of Design / DiD take part in strategic decisions of the company?		X			
Are the research / scientific aspects of Design / DiD used in the company?		X			
Does your company have a Department of Research & Development?	X				
Does your company have a Department of Sustainability?		X			
In which hierarchical level is the Department of Sustainability?					X

Source: Developed by the author

Design and sustainability of machines in agribusiness is the process of planning, implementation and control of the efficiency and cost of the flow of raw materials, in-process inventory, finished goods and related information from the place of use of the machines to the site of production for the purpose of recapturing value or proper for the layout.

The combination of specialization advantages, offered by the existence of economies of scale, with a certain degree of diversification around lines and technological capacity are competitive weapons for companies acting in the market. The large companies, mainly, have the industry integration strategy around full-lines or long-lines, which reflects the company's strategic coherence according to their level of vertical integration and the features of their fixed assets.

When available knowledge on a given subject is insufficient for the explanation of a phenomenon, the problem arises. To try and explain the difficulties expressed in trouble,





conjectures or hypotheses are formulated. The assumptions made are deducted consequences to be tested or falsified. Distort means to classify as false the consequences deduced from the hypothesis. While the deductive method is sought at all costs to confirm the hypothesis, the hypothetical-deductive method, in contrast, seeks empirical evidence to overturn it. So, after the visits and dialogues, the lack of integration between agricultural machinery design projects and sustainability has been identified.

Even if a large company has no management information regarding the mechanisms of sustainability and design projects of agricultural machines in production, it is important to notice that the measurement of these concepts is the first step to access the situation of the company's integration into the match increased productivity efforts with updated design to meet the end user.

Unaware of the extent of the uncertainties inherent in the process, specific to the Brazilian agribusiness, which puts a safety margin in demand forecast, in order not to lose sales (based on statistical and historical series of real demands) companies add their own safety margins for placement of applications, for replacement of agricultural machinery.

Another perceived aspect is the use of the sales target as demand forecasting. If this goal is often overestimated in relation to actual demand, it includes in itself a safety margin. As a result, inventory levels should be constantly above the minimum required.

There is also the anticipation of replenishment orders made without planning. It occurs when the company's purchasing department, concerned about possible delays, orders in advance, without relying on delay statistics from the supplier. What actually happens is an increased lead purchase team, often unnecessarily, increasing the time in which capital is tied up in stock.

Knowing and measuring uncertainties in the agribusiness processes, and their interaction with design and sustainability, is the first step to good practice for academic construction. Creating indicators is essential for proper dimensioning of interactivity points, ensuring the desired level of learning to better academic performance.

With these indicators, one can quantify new research opportunities associated with the activities of the machines used in agribusiness. Similarly, you can evaluate the company's production processes regarding reliability of its services and its impact on technological upgrading levels of design and sustainability.





3 THEAGRIBUSINESS POSITIONING OF KRONE

In our current economy, winning the world market for agricultural machinery means finding a way, delimiting focus, and defining strategies for a successful brand. Bearing that in mind, we have identified a growing effort from Krone in our visit to Spelle, for the correct use of the instruments that aid in the decision-making process for the strategic agribusiness of agricultural machinery. Positioning is one of these instruments, with customers in all countries where it operates.

Positioning is an important tool to support the process of strategic decisions related to the definition of the concepts of products and company producing high performance agricultural machinery and the communication of its characteristics to specific market segments (McKenna, 1993), which has been shown to be the most widely used in the literature.

We have identified that in an organization, with the characteristics of Krone, the positioning and design of agricultural machinery should be used from the moment you define your core strategy and the purpose of your business. Through that, customers will know how the company differs and what its position is in relation to the competitors in the international scenario.

The positioning of Kone has recognition and relevance in the area of engineering in the company's facilities and outsourced design offices.

There is, however, no single definition of its concept on agricultural machine design and sustainability in the literature. The concept of positioning in the production and supply of agricultural machinery can be seen in the literature both based on the perceptions of the target audience and from the strategic actions of an agribusiness company. In the literature, there is also a convergent concept that addresses the positioning of agribusiness, design and sustainability as a process that involves both the company and its target audience, the characteristics and dynamics of the market environment.

When searching in literature about positioning aimed at agribusiness, agricultural machinery, sustainability and design, we found diversity.





Positioning, for Christensen and Rocha (1989) is the image conquered by a product in the mind of the consumer. This image is the result of the type of offer made by the company, the chosen customer segment and the offers of competitors. The positioning, for the authors, guides the strategic decisions, since it defines what is expected by the consumers in relation to the relevant benefits.

Dimingo (1998) states that "positioning is the process of distinguishing a company or product from its competitors based on actual dimensions - products or corporate values that are significant to consumers - so that the company or product becomes preferred in the marketplace."

McKenna (1989) asserts that positioning should always be seen as competitive because, according to him, final customers, when they think of products and companies, always relate them to other products or companies, establishing a hierarchy in their minds.

McCarthy and Perreault (1997) consider the positioning as an important tool to support companies so that they understand their consumers, but do not formulate a well-defined concept. They claim that the positioning is contained within a product space.

Sandhusen (1998) defines positioning as the image of the brand of a product in relation to competing products. That is, the competitiveness of products according to the perception of consumers.

Porter (1999) claims that positioning is the essence of productive strategy.

According to Porter, the strategy should be, mainly, to discover positions in a certain market where the forces are weaker. For him the positioning must be established from the observation of the behavior of the competition, the suppliers, the customers, the opportunities and the threats of the environment.

Kotler (2000) reports that positioning is a consequence of the need for companies to differentiate their products (tangible or otherwise) from their competitors' offer, seeking competitive advantages by improving the characteristics and benefits brought to market. According to the author, positioning is "the act of developing the offer and the image of the company to occupy a prominent place in the minds of the target customers."

Richers (2000)conceptualizes positioning in a differentiated way. For him there is a distinction between segmentation and positioning, where positioning becomes the operational segmentation, since it touches the clients belonging to the chosen segment.





Hooley, Saunders, and Piercy (2001) argue that positioning is the way customers perceive alternative market offerings to others.

Ries and Trout (2002) define positioning very simply. For them, positioning refers to the perception that a customer will have of a product, is what the product causes in the customer's mind.

As it can be seen, most authors who describe positioning are convergent in affirming that this concept has to do with the place occupied by a company in a market and with what it represents in the consumer's mind.

Positioning begins with a product, a commodity, a service, a company, an institution or even a person, but Ries and Trout (2002) make it clear that positioning is not what is done with a product, but rather what perception your customer will have of this product.

Nowadays, in agribusiness in connection with sustainability, winning on the market requires discovering what goes on in people's minds. It is important to understand how people think and how they perceive the actions of companies. By discovering how consumers react, you can even identify the weaknesses of competitors that can become your company's strengths, thereby positioning your idea in the market mind (RIES; TROUT, 2002).

In the visit to Krone's headquarters, we were told that the positioning theory implies deciphering the perception of customers of agricultural machinery in different countries, understanding it and, from it, focusing on a unique position in the chosen segment, seeking competitiveness and maintaining the strategy already defined (PORTER, 1999). The positioning should be established on the basis of a thorough investigation of the existing forces in the market, where it is necessary to observe the behavior of competitors and suppliers, to know the customers' expectations, the opportunities and the threats of the environment (KOTLER, 1998).

However, it is not enough just to have positioning if it is not transmitted to the market correctly. It is important for organizations to be aware that today's society is over-informed, and therefore clients have begun to select and reject some of the information provided. In most cases, only what fits, at a first moment, with previous knowledge or experience, is absorbed. Therefore, when planning the placement, one must always take into consideration how the message will be transferred to the target audience (RIES; TROUT, 2002).





Ries and Trout (2002) argue that the best route to be adopted is the oversimplified message and that the positioning will only be effective when the client's problem is first recognized and then offered the solution.

There are several ways of positioning oneself, but, according to Ries and Trout (2002), two are of paramount importance. The first one is the word "impression" as in, the first contact between the product and its customer. Being the first is the most powerful positioning idea, proving the importance of the company knowing what they think, what they expect and what their customers dream about. And if it is not the first one to come to the customer's mind, then the most correct strategy is to establish a new category to be the first.

The expansion of the technologies installed in Krone agricultural machines, with its updated design and insertion to the best sustainability parameters, is strategic and uses the positioning because it is through this that the indicators are set for orientation and planning of a company with respect to your products and / or services for agribusiness. The concept of positioning has close relations with the concepts of segmentation and differentiation, which is the strategic design process.

Therefore, we understand that the positioning of an agricultural machinery company in the Krone profile is the sum of the segmentation and differentiation action, always bearing in mind that everything is designed from the perspective of the customer. The final acquiring perception should be a mirror of the positioning chosen by the company for its products and its brand.

The interview with the management of Krone showed, that Krone is not ready for the Brazilian Market and therefore denied to cooperate as a partner in the development of a new research and study project of FGV.





4 AGRICULTURAL MACHINERY AND SUSTAINABILITY

Each market and sector has its characteristics of agricultural machinery. It is here that strategic agribusiness, in perfect alignment with the pursuit of greater productivity, must guarantee coherence between the company's mission, its portfolio of products and services, the agribusiness segment, as well as the positioning to be adopted before each specialization production (NEVES, 2003).

In Agribusiness, the sustainability and positioning of the products of the agricultural machinery industries depends on:

- a) the type of crop
- b) distribution of crops geographically
- c) climate
- d) the culture and habits of the farmer
- e) the maturity of the market in special fertilizers

The above criteria serve as the basis for the strategy together with the agribusiness of price and brand in Brazil and the example of Germany, based on Krone.

FGV Agro has available studies and technical experience that allow presenting value propositions for all Brazilian agribusiness cultures as can be seen in table 2.

Table 2 -Value propositions to the main crops.

MAIN CROPS	%
Soybean	49
Fruits and Vegetables	22
Coffee	15
Cereals (Corn and Wheat)	4

Source: Developed by the author, 2016.

Over the last decades, crops have expanded throughout Brazil. For example, soybeans are the Brazilian agricultural crop that has grown the most in the last three decades and corresponds to 49% of the area planted in grains of the country. Increased productivity is associated with grains of the country.

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Increased productivity is associated with technological advances, management and efficiency of producers. Grain is an essential component in the manufacture of animal feed and with increasing use in human food, is in rapid growth.

Cultivated especially in the Midwest and South regions of the country, soybean has established itself as one of the most outstanding products of national agriculture and trade balance.

In the cerrado, the cultivation of soybeans became possible thanks to the results obtained by the research of the Brazilian Agricultural Research Corporation, in partnership with producers, industrialists and private research centers. Advances in this area also led to an increase in average productivity per hectare, reaching the highest indexes in the world.

The total coffee planted area in Brazil is 2.21 million hectares, of which 267 thousand are in formation and 1.94 million in the production process. Arabica coffee accounts for 1.75 million hectares, equivalent to 79.2% of the total planted area, with a growth forecast of 13.8 thousand ha in relation to the 2015 harvest. Minas Gerais has the largest area, with 1.18 million hectares equivalent to 67% of the country's total. For the conilon, however, there is a reduction of area of 5.4%, reaching 456 thousand hectares. Of this total, 417.4 thousand are in production and 38.6 thousand are being formed. The State of Espírito Santo has the largest area of the species, with 286.4 thousand hectares, followed by Rondônia (94.6 thousand) and Bahia (41.5 thousand).

The continental dimensions of Brazil allow the most diverse variations of climate and natural environments. It is possible to find in a single territory equatorial, sub-arid, tropical and sub-tropical climates. This is because Brazil has 8.547.403 km² and is drawn both by the Equator and the Tropic of Capricorn. Therefore, it is a territory that counts on very different climatic characteristics. On the other hand, in nature, plants have different life cycles and different times to be born and reproduce: growing the right kind at the right time is the key to a happy garden. Autumn, the season in which the leaves fall and everything is renewed, is also the ideal season for the growth of several plants.

In the South, it is the ideal time for Fava planting: March to June; Leek: April to June; Strawberry: April to May; Mandioquinha: April to May; Watercress: autumn and winter; Garlic: May to June; Turnip: April and May; Flaxseed: April to June.





North: beet, eggplant, celery, brussels sprouts, cucumbers, fava de seville.

Northeast: zucchini, butter kale, green onions, arugula, coriander, leek, onion.

Midwest: cayenne pepper, peas, Chinese cabbage, petsai, beets, cabbage and carrots.

Southeast: celery, radiche, lettuce, chard, Brussels sprouts, mustard.

The relationship between climate and agribusiness is therefore an unquestionable fact. Factors such as the amount of rain, temperature and soil irrigation determine the crop that will occur in each region. To ensure quality and sustainability for users of its agricultural machinery, Krone has developed technological solutions that compensate for the excess or deficit of rain, resistance to extreme heat or frost, stability or irregularities of the terrain, ensuring healthy production and harvesting.

Brazil's agribusiness is going through a technological storm. The farmer has a long-term vision to make his business sustainable. We must bear in mind that about 1/3 of the Brazilian agribusiness is attributed to the agricultural production carried out by the family farmers. It is also worth noting that the recent performance of family agriculture and agribusiness articulated has been very positive, with growth, even to those of the employer segment.

The improvement in the performance of family agriculture is directly related to the bet on greater technological contribution and reduction of the fragility of technical assistance. The farmer has realized that the use of agricultural machinery, with up-to-date technologies, adequate design and sustainability, can reduce the chemical, physical and biological degradation of the soil, which is a non-renewable good, conserving water quality and plant health, as well as having the role of providing food to the world population and energy by increasing crop productivity.

The sustainability of machine producers in Brazilian agribusiness considers:

- a) a target market in strong growth in the cultures where it intends to act
- b) identifies the regions where consumers / crops are
- c) examines the climate and soil of each region and culture, and concluded with its technical team the value proposition to be delivered to satisfy its clients
- d) a farmer increasingly appreciating the compatibility between the use of fertilizers and the automation of agricultural machinery in pursuit of a higher level of productivity.







5 DESIGN AND AGRICULTURAL MACHINERY IN BRAZIL

To bridge the gap between academia and professional life it is intended to find partners in the production area of agricultural machinery. Therefore, 300 Brazilian companies (see attachment) producing agricultural machines were interviewed. The results of the interviews are presented in table 3. Only a few Brazilian companies have a design department established.

Table 3 - Overview on the interview results with 300 Brazilian companies producing agricultural machinery

"Industrial Design (DiD) is a strategic process of
problem solving that drives innovation, builds
business success and leads to a better quality of life
through innovative products, systems, services and
experiences."
"Sustainability is the process of change in which the

"Sustainability is the process of change in which the exploitation of resources, the direction of investments, the orientation of technological and institutional change are developed in harmony and reinforce the current and future potential to meet human needs and aspirations."

ANSWER 300 Brazilian Companies

DESCRIPTIONS	YES	NO	HIGH	MEDIUM	LOW
Does your company have a Department of Design / DiD?	8	292	-	-	-
In which hierarchical level is the Department of Design?	-	-	4	3	293
Does your company outsource the activity of Design / DiD?	297	3	-	-	-
Does your company establish what to outsource and what to develop internally?	205	5	-	-	-
Do designers and engineers work together in the production process / delivery? To be continued					-
Conclusion	0	300	-	-	





DESCRIPTIONS	YES	NO	HIGH	MEDIUM	LOW
Does the Department of Design / DiD take part in the market strategic of the company?	0	300	-	-	-
Does the Department of Design / DiD take part in strategic decisions of the company?	2	298	-	-	-
Are the research / scientific aspects of Design / DiD used in the company?	4	296	-	-	-
Does your company have a Department of Research & Development?	0	300	-	-	-
Does your company have a Department of Sustainability?	2	298	-	-	-
In which hierarchical level is the Department of Sustainability?	-	-	0	7	293

SOURCE: Developed by the author, 2016.

Therefore, manufacturers that operate on a similar analyzing technique, while producing for different markets, and produce at least one of the groups of agricultural equipment with their respective implements and accessories, can be classified by long-line strategy, as, for example, companies that have a primary focus on manufacturing specific tractors for civil construction, but take advantage of the similarity of the productive process and consequent economies of scope and scale, including in its production line for agricultural tractors.

In compliance with the FGV AGRIBUSINESS, academic performance and ongoing research with the agricultural machinery companies, it should be crafted with a maximum number of suppliers, PARTNERS. The partnership implies interdependence between the parties, mutual trust and a long-term relationship. But this is not enough to characterize a PARTNERSHIP. There are other determining factors that we will consider:







- a) frequent communication between the parties
- b) release any information deemed necessary by the other party
- c) system of academic research information based on protocols
- d) delivery frequency work of companies and FGV
- e) the parties are obliged to inform about new projects
- f) guarantee quality of information that does not require inspection
- g) production continued scientific work
- h) loyalty from the company and FGV in the use of data
- i) ease of communication
- j) joint development of new research, experiences and ideas
- k) availability for dissemination and interactivity
- 1) flexibility between the parties to provide assistance and cooperation
- m) joint negotiation as the credits and other academic conditions
- n) punctuality and guarantee deliveries
- o) bureaucracy reduction (elimination of paper, flexibility of rules, routines)
- p) authorization for delivery of information and data on informal basis
- q) keep the doors of businesses open, so that the parties can move
- r) keep a tight integration between the parties so as to increase productivity
- s) provide technological cooperation by both and for the benefit of both
- t) share investments in new research that have mutual benefits
- u) add permanent sustainability campaigns and integrated design
- v) share Information dissemination and social protection
- w) dispose of all searches in aid to the other
- x) develop joint efforts of training and professional development





6 PERSPECTIVES FOR PARTNERS FGV AND BERGISCHE WUPPERTAL UNIVERSITY

The CEDES-the Center for Design and Sustainability of the FGV Agribusiness-Getúlio Vargas Foundation, develop studies and projects related to Design, Sustainability and Agribusiness.

In this work we will make a didactic integration plan between sustainability design and agricultural machinery, aiming at improving the learning and insertion of the FGV, because evaluating the environment in which it is found the need to make this plan so that it can Be ahead of the other organizations in reference, as the use of agricultural machinery in agribusiness needs to integrate students design knowledge and sustainability. This done, you will see that it is really an organization to have as a reference in the integrative capacity of essentially strategic areas.

We will carry out actions such as dissemination through social networks to reach the largest number of professionals and other students from FGV partner education centers.

This plan combined with the discipline aims to achieve the expected results in a year, since, after these actions, the FGV will be much better known as a present in the approach of design with the agricultural machinery adjusted to the required sustainability standards, highlights the role of research and the classroom in this process of education and diffusion of knowledge. The student of agribusiness at FGV will be the professional responsible for generating information on the accumulated assets of the agribusiness sector, evidencing his academic and professional career situation. Thus, it is not enough just to learn about design and agricultural machinery used in agribusiness, but above all to generate critical maturity, identifying at all times the key role in the construction of a routine analysis methodology and interpretations.

Nature of the research: description and analysis of the research process and its types, dealing mainly with issues related to the risk of obtaining and processing information; Managing research and conducting activities related to social research; Definition of the environmental sustainability process: definition of the economic parameters, objectives and limits of the investigations, leading to the elaboration of the conceptual project of the research. Research structuring: transformation of conceptual design into technical research project - operation of previously established definitions (hypotheses, sampling, structuring of





the data collection and technique). Conducting the research: organization of field work and conducting analyzes and conclusions - resulting in the final report of the research.

The course intends to examine, from a historical point of view, the relations established between the design and society in Brazil of agribusiness. Thus, we will promote the analysis of the process of construction of the integrating framework that gave expression and sustentation to these relations, as well as the assembly of the conceptual apparatus elaborated by the bibliography to define them.

The expected result is an increase in arguments with agricultural machinery companies in agribusiness, offering integrated solutions to design and sustainability, with this, we can increase our learning and consequently also leverage the stimulation of new academic approaches and production of books and avoiding the loss of challenging stimuli for the new students in their purposes while seeking the FGV.

6.1 NEW DISCIPLINE: SUSTAINABILITY MACHINERY-DESIGN

To fill the gaps and to support future agricultural business by academic research a new study program was developed:

Prof. Carlos Alberto Decotelli da Silva

E-mail: decotelli@fgvmail.br

6.1.1 General objectives of discipline

This course aims to show the interaction of strategies and practices that can be used to agribusiness management, using the design and sustainability applied to agricultural machinery in productive activity in Brazil.

- Knowing and integrating the design and sustainability of agricultural machinery
- Developing the ability to access agribusiness information and interpret them
- Discussing current strategies of design and sustainability in agricultural machinery
- Entering the FGV academic environment the continued interest in the studies of the Brazilian agribusiness, design, productivity and sustainability





6.1.2 Programming

The new study program contains 10 units described in table 4.

Table 4 - Lectures in the new discipline: Sustainability Machinery-Design

CLASS	SUBJECT MATTER
01/10	Agricultural machines and the inclusion of sustainability in agribusiness
02/10	The Design of agricultural machinery
03/10	Agribusiness and Sustainability
04/10	Design in Agribusiness
05/10	Design and Innovation
06/10	Sustainability and agricultural productivity
07/10	Adaptations in agribusiness agricultural machinery
08/10	Technological innovation and social environment
09/10	Agricultural machines and the economic measurement
10/10	Agricultural productivity and environmental integration

Source: Developed by the author, 2016.

6.1.3 Workshops

The lectures will be completed by a couple of workshops in which the students are asked to develop and to prove strategic approaches to research on future agricultural business, according to table 5.







Table 5 - Overview on the content and	I the objectives to be reviewed of workshops
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Table 5 - Overview on the content and the objectives to be reviewed of workshops					
TITLE	DESCRIPTION	OBJECTIVES TO BE REVIEWED			
Agribusiness and Design	By identifying key that affect policy performance and scenarios for how these factors might evolve design and agribusiness in the future.	Agriculture Price support price for farmers is calculated using an integrated set of five cost factors including: cost of production; input prices; input/output price parity; and terms of trade.			
Sustainability	Some of the inherent sustainability in socio-economic and ecological conditions can be anticipated, and monitoring of key indicators can help trigger important policy adjustments, both semi and fully-automatic, to keep agribusiness policy.	Weather risk measured by an index based on historical climate data, rather than the extent of crop yield loss. These weather insurance contracts have been found to offer quick payouts triggered by independently monitored productivity agribusiness result.			
Productivity	Regular review, even when the policy is performing well, and the use of well-designed pilots throughout the life of the policy to test assumptions related to performance, can help address.	Weather indexed insurance in India - was implemented on a pilot basis for various crops and locations by trying out different types of delivery models. The implementing agencies in India reported that this pilot experience was valuable to better understand risk parameters and the potential for commercial expansion.			
Machines and production and Business	Given the complexity of most policy settings, implementing a variety of production and automation same issue increases the likelihood of achieving design.	Agriculture and Business Risk Management approach. A suite of four programs were employed including AgriInvest for smallincome declines; AgriStability providing support for large income losses.			

Source: Developed by the author, 2016.

6.1.4 Cooperation with Bergische University of Wuppertal

Develop a critical approach that allows students to properly apply the methods of use of agricultural machinery and its interconnections with the design and sustainability in order to generate scientific work appropriate to the current academic requirements of Brazilian agribusiness:

- a) to train the students to develop an integrated view of sustainability
- b) providing advice on the various methods of use of agricultural machinery
- c) developing the ability to structure design projects and sustainability





- d) developing critical and analytical vision of agribusiness and machine design
- e) to enable students to develop research projects applied to sustainability, suitable for the development of the design of agricultural machinery
- f) developing knowledge of the various currents of sustainability
- g) developing knowledge on productivity of agricultural machinery
- h) developing knowledge of integrated design to user satisfaction

Throughout the course, pre-projects will be developed individually, which should lead to the completion of course work. At this stage, classes begin with a brief exposition of the main concepts, followed by exercises for the fixing and presentation of the progress of pre-projects, for monitoring and mentoring.





CONCLUSION

It is said that in the design and in the segment of agricultural machines used in food production, there is little research, or our undergraduate students and graduate students are unable to carry out scientific research quality and diverse.

The methodological weakness that still surrounds our researchers—undergraduates and graduates—is due, in great part to the school experience, little accustomed to the guidance in the reading area, textual production and scientific methodology application.

With proper guidance and motivation, however, our students will always be able to investigate, reflect, create and contribute to the production of knowledge in academic circles. Betting on this hypothesis, we complete this work, learning that belief in the potential of each one of them is the first step toward the development of self-confidence and self-esteem necessary for scientific research at all levels, and in all areas of knowledge. So deeply identified, BOTH in Germany and in company with worldwide technological reference quality mechanical and electronic engineering, the design is still a field of knowledge out of strategic priorities. We suggest new work, look increasingly interact with multidisciplinary and sustainability as a long-term strategic benchmarks in FGV classes.

Production growth based on increased productivity levels was a key factor in the environmental preservation. If this had not occurred, it would be necessary to double the area currently explored to reach the current level of production.

With good time and performance of the sector's exports and the growing supply of jobs in the supply chain cannot be attributed only to the Brazilian agricultural vocation. Technological development and modernization of rural activities, obtained through research and the expansion of the machinery and tools industry, also contributed to making the country one of the most reputable global agribusiness platforms.

The research was mainly based on interpretative analysis of phenomena and facts to reach the answers to the questions on the problem of design and sustainability. By its nature, this approach allowed the research is restraining the amount of facts or phenomena studied, because what matters is to show the specific research object particulars involved in a wide variety of Brazilian companies with related activities to the production of machinery for the agribusiness. The results from this approach can be, but did not have the purpose of being, applied to other cases, phenomena or similar facts.

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The research undertaken with this approach, intended to understand processes experienced by groups of companies: present contributions in change processes or formulating views on design and sustainability interpret peculiarities of behavior and attitudes.

It should be emphasized that such approaches were combined in the same survey. They do not necessarily rule out but were completed and made the results more accurate research work.

The deals with the existing agricultural business (or "inside the gate") representing farmers, whether small, medium or large producers, made in the form of individuals (farmers or peasants) or legal entities (companies).

The Brazilian agribusiness through grain production pushed the physical boundaries of the property showing all its growth potential and investment needs which turns into a real investment opportunity in this sector. The Brazil that is increasingly dependent on inputs. There are different agents in the production process, including the farmer, in a permanent negotiation upon quantities and prices.

The machining is done to lower the cost of production. The embedded electronic term is applied, therefore, to all electronic devices and their peripherals, installed in vehicles and mobile machinery, as well as those fixtures that provide support for embedded.

It should do the job without great expense and with the least possible damage to plants. The alignment of research to technological development processes applied to agribusiness integrating the use of electronic devices on tractors and harvesters is not new. The onboard electronics on tractors and harvesters has become common in developed countries. With the advent of integrated circuits and more recently of microprocessors, it became feasible to develop electronic circuits cost and reliability compatible with its use in agricultural machinery and design.

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Fone 55(16)3382-8222

72.CNH INDUSTRIAL LATIN AMERICA LTDA.

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Fone 55(31)2104-3000

73.COMBINE INDÚSTRIA E COMÉRCIO DE MÁQUINAS AGRÍCOLAS LTDA.

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Fone 55(16)3628-7428

74.COMÉRCIO DE FORNOS MACIESKI LTDA. ME

Site http://www.secadormacieski.com.br

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75.COMÉRCIO E INDÚSTRIA DE EQUIPAMENTOS PARA SUÍNOS MUXO LTDA-ME

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76.COMIL SILOS E SECADORES LTDA.

Site http://www.comil.com.br

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77.COMPANHIA LILLA DE MÁQUINAS INDÚSTRIA E COMÉRCIO

Site http://www.lilla.com.br

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Fone 55(11)3511-4488

78.CONSILOS INDUSTRIAL LTDA.

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Fone 55(45)3228-3434

79.CONSTRUSUI METALÚRGICA LTDA. - ME

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80.D L EQUIPAMENTOS AGROPECUÁRIOS LTDA. ME

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81.DALL' AGNOL EQUIPAMENTOS AGRICOLAS LTDA - ME

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82.DANIEL DE CARLI & CIA LTDA. - ME

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Fone 55(55)3542-2130

83.DELAVAL LTDA.

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84.DMB MÁQUINAS E IMPLEMENTOS AGRÍCOLAS LTDA.

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85.DRAGÃO SOL INDÚSTRIA E COMÉRCIO DE MÁQUINAS LTDA.

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86.DRIA IMPLEMENTOS AGRÍCOLAS LTDA.

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87.E. POLITI - EPP

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88.EATON LTDA

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89.ECLÉTICA AGRÍCOLA LTDA.

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90.EDEGE EQUIPAMENTOS AGRO-PECUÁRIOS LTDA.

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91.EDER STADLER - ME

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92.EDSON FERREIRA - ME - SERMAQ

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93.EIRICH INDUSTRIAL LTDA.

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94.ELETROVENTO S/A.

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95.ELIPAL IND.E COM.DE EQUIPAMENTOS AGRÍCOLAS LTDA.

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96.ENTRINGER INDUSTRIAL S.A.

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97.ESTRUTURAL ZORTEA INDÚSTRIA E COMÉRCIO LTDA.

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98.ESTUFASUL LTDA.

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99.FABIO VUOLO DAL MOLIN - ME

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100.FÁBRICA DE ESQUADRIAS HEMSING LTDA. - ME

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101.FÁBRICA DE IMPLEMENTOS AGRÍCOLA TADEU LTDA.

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Fone 55(47)3379-1134

102.FÁBRICA DE MÁQUINAS COPLING LTDA.

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103.FÁBRICA DE MÁQUINAS SPIELMANN LTDA. - ME

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104.FANKORTE INDÚSTRIA DE MÁQUINAS E EQUIPAMENTOS LTDA – ME

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105.FARENZENA SERRALHERIA E FERRAGENS LTDA. EPP

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106.FERRÃO CONTENÇÕES E ORDENHADEIRAS LTDA. - EPP

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107.FERRONATO MÁQUINAS E EQUIPAMENTOS AGRÍCOLAS LTDA. - ME

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108.FIDO-FÁBRICA DE IMPLS.AGRIC.DAVID DE OLIVEIRA LTDA

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109.FIMAG FÁBRICA ITALIANA DE MÁQUINAS AGRÍCOLAS LTDA.

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110.FITARELLI MÁQUINAS AGRÍCOLAS LTDA. EPP

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111.FJR CAMPOS MÁQUINAS AGRÍCOLA LTDA. ME

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112.FLAMAR IMPLEMENTOS RODOVIÁRIOS LTDA.-EPP

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113.FOCKINK INDÚSTRIAS ELÉTRICAS LTDA.

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114.FOLMAQ - MÁQUINAS E IMPLEMENTOS AGRÍCOLAS LTDA. - ME

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115.FORNARI LTDA. EPP

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116.FRANZONI MÁQUINAS ESPECIAIS LTDA.

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117.FRAVI IND. COM. EQUIPAMENTOS AGRÍCOLAS LTDA. ME

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118.FRIESE EQUIPAMENTOS INDUSTRIAIS LTDA.

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119.FUMAJET INDÚSTRIA E COMÉRCIO DE EQUIPAMENTOS S.A.

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120.FUNDIÇÃO JACUI S/A.COM.E IND.DE MÁQUINAS AGRÍCOLAS

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121.G.A. OLIVEIRA INDÚSTRIA E COMÉRCIO - ME

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122.GALLUS INDÚSTRIA E COM. DE MÁQS. E EQUIPAMENTOS PARA AVICULTURA LTDA.

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123.GEAR TECNOLOGIA INDUSTRIAL LTDA. - EPP

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124.GEDARTHIL INDÚSTRIA E COMÉRCIO DE ARTEFATOS PLÁSTICOS LTDA. (PLASMATTE)

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125.GIO IMPLEMENTOS AGRÍCOLAS LTDA. EPP

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126.GIORDANO INDÚSTRIA E COMÉRCIO DE CARROCERIAS E TRONCOS LTDA. - ME

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127.GOMES MÁQUINAS E TRANSPORTES LTDA. EPP

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128.GRANFINALE SISTEMAS AGRÍCOLAS LTDA.

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129.GREENPEÇAS IND.COM.MÁQUINAS EQUIPAMENTOS LTDA. EPP

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130.GTS DO BRASIL LTDA.

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Fone 55(49)3251-7100

131.GUARANY INDÚSTRIA E COMÉRCIO LTDA.

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Fone 55(11)2118-8400

132.H E MÁQUINAS LTDA.

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133.HAASAT INDÚSTRIA E COMÉRCIO METAL MECÂNICO LTDA - EPP.

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Fone 55(49)3621-1035

134.HAMILTON PICOLOTTO & CIA. LTDA. EPP

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135.HERBICAT LTDA.

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Fone 55(17)3524-9797

136.HERDER DO BRASIL LTDA.

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Fone 55(16)3382-8010

137.HIDROGOOD HORTICULTURA MODERNA LTDA. - EPP

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138.HTA INDÚSTRIA E COMÉRCIO LTDA.(HONDA)

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Fone 55(11)5576-5418

139.HUSQVARNA DO BRASIL IND. E COM. DE PRODTS PARA FLORESTA E JARDIM LTDA.

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140.IFLÓ INDÚSTRIA DE EQUIPAMENTOS AGRÍCOLAS LTDA.

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141.IKEDA EMPRESARIAL LTDA.

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142.IMPLANOR IMPL.AGRÍCOLAS DO NORDESTE IND.COM.LTDA.

Site http://www.implanor.com.br

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143.IMPLEMENTOS AGRÍCOLAS JAN S/A

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Fone 55(54)3332-6500

144.IMPLEMENTOS AGRÍCOLAS MARISPAN LTDA.

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145.INCOMAGRI IND.E COM.DE MÁQUINAS AGRÍCOLAS LTDA.

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146.INDÚSTRIA DE EQUIPAMENTOS ELETRO WISA LTDA.

Site http://www.widitec.com.br

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Fone 55(55)3375-4499

147.INDÚSTRIA DE ESQUADRIAS FEILFER LTDA. ME

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Fone 55(49)3636-1230/55(49)3636-1200

148.INDÚSTRIA DE IMPL.AGRIC.VENCE TUDO IMP.EXPORT.LTDA

Site http://www.vencetudo.ind.br

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149.INDÚSTRIA DE IMPLEMENTOS AGRÍCOLAS SILTOMAC LTDA.

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150.INDÚSTRIA DE MÁQUINAS AGRÍCOLAS VIAPIANA LTDA - ME

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151.INDÚSTRIA DE MÁQUINAS YAMASA LTDA.

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Fone 55(18)3583-1116

152.INDÚSTRIA DE ROÇADEIRAS DESBRAVADOR AVARÉ LTDA.

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153.INDÚSTRIA E COM.ELETRO ELETRÔNICA GEHAKA LTDA.

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154.INDÚSTRIA E COMÉRCIO DE IMPLEMENTOS AGRÍCOLAS TURIM LTDA. ME

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155.INDÚSTRIA E COMÉRCIO DE MÁQUINAS POLIDRYER LTDA.

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156.INDÚSTRIA E COMÉRCIO MECMAQ LTDA.

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Fone 55(19)3417-4090

157.INDÚSTRIA E COMÉRCIO PALUDO LTDA. - EPP

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158.INDÚSTRIA MECÂNICA KNAPIK LTDA. - EPP

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159.INDÚSTRIA METALÚRGICA METALRED LTDA - ME

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160.INDUSTRIAL AGRÍCOLA CHIUMENTO LTDA.

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161.INDUSTRIAL ATILLA LTDA.

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162.INDUSTRIAL PAGÉ LTDA.

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163.INDÚSTRIAS MACHINA ZACCARIA S/A.

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164.INDÚSTRIAS MECÂNICAS ROCHFER LTDA.

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165.INDÚSTRIAS REUNIDAS COLOMBO LTDA.

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166.INDUTAR TECNO METAL LTDA.

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167.INOBRAM - ASSESSORIA E SERVIÇOS EM AUTOMAÇÃO ELETRÔNICA LTDA. ME

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168.IPACOL MÁQUINAS AGRÍCOLAS LTDA.

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169.ISMAEL TRINDADE TEIXEIRA - EPP

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170.ITALFLOR IND. E COM. DE MÁQUINAS AGRÍCOLAS LTDA. (METALFOR)

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171.J A KULZER & CIA LTDA.-ME

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172.J FLEX INDÚSTRIA E COMÉRCIO LTDA.

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173.J G IND.E COM.DE CARROCERIAS LTDA - EPP(CARROCERIAS BANDEIRANTES)

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174.J. R. INDÚSTRIA DE EQUIPAMENTOS AGRÍCOLAS EIRELI - ME

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177.JAIRO LUIZ CAVALLI & CIA LTDA - EPP

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178.JCB DO BRASIL LTDA.

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179.JNS INDÚSTRIA E COMÉRCIO DE EQUIPAMENTOS LTDA.

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180.JOHN DEERE BRASIL LTDA.

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181.JONAS DEUNER – ME

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182.JOSÉ LÚCIO DE ANDRADE. EPP

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183.JUSTINO DE MORAIS IRMAOS S/A.

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184.K.O.MÁQUINAS AGRÍCOLAS LTDA.

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186.KEPLER WEBER S/A.

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187.KILBRA TRADING EQUIPAMENTOS PARA AVICULTURA LTDA

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188.KOMATSU DO BRASIL LTDA.

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189.KONTENTOR EQUIPAMENTOS AGROPECUÁRIOS LTDA.

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190.KUHN DO BRASIL S/A. - IMPLEMENTOS AGRÍCOLAS

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191.KUHN-MONTANA INDÚSTRIA DE MÁQUINAS S/A

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192.L.F. PASINI & CIA. LTDA. (TRONCOS PROGRESSO)

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193.LABOREMUS IND.E COM.DE MÁQUINAS AGRÍCOLAS LTDA.

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194.LS MTRON INDÚSTRIA DE MÁQUINAS AGRÍCOLAS LTDA. (LS TRACTOR)

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195.LUBING DO BRASIL LTDA.

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196.LUCHESI & LUCHESI LTDA. ME

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197.LUMA IMPLEMENTOS AGRÍCOLAS LTDA.

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198.M. SEVCIUC IVETI - ME

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199.MAGNANI - IMPLEMENTOS PARA SUINOCULTURA LTDA. EPP

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200.MAGNETO BRASIL LTDA.

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Fone 55(15)3202-1496

201.MAGNO JET INDÚSTRIA LTDA.-EPP

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202.MALFI INDÚSTRIA COMÉRCIO MÁQUINAS E EQUIPAMENTOS PRÉ PLANTIO LTDA. ME

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Fone 55(41)3656-7260

203.MAQOESTE INDÚSTRIA DE MÁQUINAS LTDA.- ME

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204.MAQSOLO INDÚSTRIA E COM. DE MÁQUINAS E IMPLEMENTOS AGRÍCOLAS LTDA.- ME

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205.MÁQUINAS AGRÍCOLAS JACTO S/A.

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206.MÁQUINAS AGRÍCOLAS SANTANA LTDA. - ME

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207.MÁQUINAS MATIPÓ LTDA - EPP

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208.MARCASSIO INDÚSTRIA E COMÉRCIO DE MÁQUINAS AGRÍCOLAS LTDA. EPP

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209.MARCELO SCHMIDT & CIA LTDA. - ME

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210.MARCHER BRASIL AGROINDUSTRIAL S/A.

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211.MARCHESAN IMPLEMENTOS E MÁQS.AGRÍCOLAS TATU S/A.

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212.MARKAL INDÚSTRIA E COMÉRCIO DE EQUIPAMENTOS AGRÍCOLAS LTDA. **EPP**

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213.MATÃO EQUIPAMENTOS INDUSTRIAIS E AGRÍCOLAS LTDA.

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214.MATSUDA EQUIPAMENTOS LTDA.

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215.MAURO ANTÔNIO LUVIZOTO - ME

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216.MECÂNICA INDUSTRIAL MBO LTDA. EPP

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217.MENEGON AUTOMOTIVOS LTDA ME

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218.MENTA MÁQUINAS AGRÍCOLAS LTDA.

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219.MEPEL MÁQUINAS E EQUIPAMENTOS LTDA.

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220.METALCAMPO IMPLEMENTOS AGRÍCOLAS LTDA - ME(METALFERRI)

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221.METALKA EQUIPAMENTOS LTDA. - EPP

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Fone 55(48)3645-6266

222.METALÚRGICA ADAMS LTDA.

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223.METALÚRGICA TAPAJÓS LTDA.-ME

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224.METALÚRGICA TRAPP LTDA.

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225.METALÚRGICA TUZZI LTDA.

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226.METALÚRGICA VENDRUSCOLO LTDA.-ME

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227.METALÚRGICA ZANCHETTA LTDA. ME

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228.MFW MÁQUINAS LTDA.

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229.MINAMI INDÚSTRIA DE APARELHOS PARA A LAVOURA LTDA.

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230.MOLBOR INDÚSTRIA E COMÉRCIO DE ARTEFATOS DE BORRACHA LTDA. - EPP

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231.MOLDEMAQ MAQUINAS E IMPLEMENTOS AGRICOLAS LTDA.

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232.MUNDO NOVO MÁQUINAS AGRÍCOLAS LTDA.

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234.NIVALDO MUNDIN JUNIOR EIRELI - ME

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235.ORDEMILK LTDA. - EPP

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236.OSLAIR CEZAR IMBRIANI - ME

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237.OSMARILDO DAL MOLIN - ME

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238.P.L.A. MÁQUINAS PULVERIZADORAS E FERTILIZADORAS S.A.

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240.PEROZIN INDÚSTRIA METALÚRGICA LTDA.

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242.PINHALENSE S/A. MÁQUINAS AGRÍCOLAS

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243.PLASSON DO BRASIL LTDA.

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244.PPL INDÚSTRIA DE REBOQUES LTDA.

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245.PRAMARC - INDÚSTRIA E COMÉRCIO EQUIPAMENTOS AGRÍCOLAS LTDA - EPP

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246.PULSFOG PULVERIZADORES LTDA.

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Fone 55(11)4054-0313

247.RANE PIEROTI FERREIRA NETO - ME

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248.REALMAQ MÁQUINAS AGRÍCOLAS LTDA.- EPP

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249.REFRIBRASIL INDÚSTRIA E COMÉRCIO LTDA.

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251.RICARDO M. EBERT - ME

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253.RO AGROPECUARIA LTDA. ME

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254.ROÇADEIRAS MARÍLIA LIMITADA. ME

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256.RUBEMAQ INDÚSTRIA E COMÉRCIO LTDA.

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257.RUGERI MEC-RUL S/A.

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258.S C CABINES E ACESSÓRIOS LTDA - ME

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259.SANSUY S/A. INDÚSTRIA DE PLÁSTICOS

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260.SANTA IZABEL IMPLEMENTOS AGRÍCOLAS LTDA.

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261.SATHYA MAQUINARIAS EIRELI

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262.SAUR EQUIPAMENTOS S/A.

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263.SCHEMAQ INDÚSTRIA DE IMPLEMENTOS AGRÍCOLAS LTDA. ME

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264.SCHUMACHER INDUSTRIAL LTDA.

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Fone 55(51)3470-6900

265.SCOLARO EQUIPAMENTOS EIRELI - EPP

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266.SEMECAT - SERRALHERIA E METALÚRGICA CATANDUVA LTDA.

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267.SÉRGIO KNORST & FILHO LTDA.- EPP

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Fone 55(51)3569-1127

268.SIGA IMPLEMENTOS AGRICOLAS LTDA - ME

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Fone 55(55)3537-4660

269.SOLLUS MECANIZAÇÃO AGRÍCOLA LTDA.

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270.SOLOMAQ LTDA.

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271.SPÉZIA METAL AGRÍCOLA LTDA.

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272.STABRA INDÚSTRIA E COMÉRCIO LTDA.

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273.STARA S/A. INDÚSTRIA DE IMPLEMENTOS AGRÍCOLAS

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Fone 55(54)3332-2800

274.STIHL FERRAMENTAS MOTORIZADAS LTDA.

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275.SWZ INDÚSTRIA LTDA.

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276.TECNOESSE INDÚSTRIA E COMÉRCIO LTDA.

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277.TEKAL EQUIPAMENTOS PARA AVICULTURA LTDA - EPP

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278.TELAS BOTINHA LTDA. - ME

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279.TIAGO MIRANDA DE FIGUEIREDO - ME

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280.TORNEADORA DOIS IRMÃOS LTDA.

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281.TRAMONTINA MULTI S/A.

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282.TREVISAN EQUIPAMENTOS AGRO-INDUSTRIAIS LTDA. ME

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285.TROPICAL ESTUFAS AGRÍCOLAS LTDA.

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287.TURBOFERRO INDÚSTRIA E COMÉRCIO DE FERROS LTDA.

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288. VANDERLEI BERNADINO JANUÁRIO- EPP

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289. VEIGRO INDÚSTRIA DE MÁQUINAS E EQUIPAMENTOS LTDA.

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290. VENCOMATIC DO BRASIL LTDA.

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291. VENETO INDUSTRIA DE MAQUINAS EIRELI - EPP

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292. VICON MÁQUINAS AGRÍCOLAS LTDA.

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293. VIDEFERRO INDÚSTRIA DE IMPLEMENTOS RODOVIÁRIOS LTDA.

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295. VOSSER INDÚSTRIA E COMÉRCIO DE GERADORES DE CALOR LTDA. - EPP

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299.WERNER IMPLEMENTOS AGRÍCOLA LTDA.

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