



Developing segment-specific business models for agricultural crop protection distributors in South Africa

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ABSTRACT

Agriculture faces several challenges these days, most notably is the worldwide key challenge of providing sustainable food supply and agricultural systems to a population that is expected to grow to 10 billion by the year 2050 (FAO, 2017a). The report clearly states that “business as usual” by all stakeholders should be critically assessed to address major transformation in agricultural systems, rural economies, and natural resource management. The Crop Protection Distribution has seen significant changes, ranging from consolidation in suppliers, consolidation in growers due to continued sustainability pressure, including commodity prices and increased input costs, to accelerated adoption of technology. This caused a significant threat to the Crop Protection Distribution profitability, sustainability, and challenges what value they present to growers. We have seen dozens of Crop Protection Distributors and cooperatives exiting the market. Research in the segment-specific business models in the Crop Protection Distribution Industry is limited, specifically in South Africa. In *Lithuania* researchers propose that a that the business model that focusses on product production accompanied by limited service is no longer suitable. They draw attention to the fact that the product plus service business model should be implemented. Compared to South Africa, who has a traditional channel business model of extensive service plus product through Independent Affiliated Commissioned Agents which was adopted in the early 1990s. This approach is no longer applicable to this study. This study analysed and developed segment-specific business models for Crop Protection Distributors in South Africa, based on the needs and wants of the growers in each of those segments.

Keywords: Crop protection, business models, B2B, B2C, E-Commerce, value innovation.

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LIST OF ABBREVIATIONS

BBBEE	Broad-based Black Economic Empowerment
CRM	Customer Relationship Management
FAO	Food and Agriculture Organisation
FBN	Farmers Business Network
GDP	Gross Domestic Product
IT	Information Technology
SMME	Small, Medium and Micro Enterprises
VKB	Vrystaat Koöperasie Beperk
VUCA	Volatile, Uncertain, Complex, Ambiguous

CHAPTER 1: INTRODUCTION AND CONTEXTUALISATION OF STUDY

1.1 INTRODUCTION

The research study has the core objective to develop segment-specific business models for Crop Protection Distributors in South Africa, and primarily the suggestions from this research are to be adopted and implemented by InteliGro.

The Business Model Concept, as developed by Osterwalder *et al.* (2005), has been extensively researched since its inception in 2005. It is known not only to promote continuous improvement and increased timeous reaction capacity within an organisation. Still, it can create a competitive advantage to address the relevancy, profitability, and sustainability of an organisation.

The Crop Protection Industry most notably faces numerous challenges, one where Crop Protection Distributors (seen as a “middle-man” in the value chain) has seen a significant deterioration in profit margins which threaten the very existence of Crop Protection Distributors.

The phenomena are not limited to countries like the USA, Brazil and Australia, but has spiralled down to the inevitable impact on the Crop Protection Distributors in South Africa. It is noteworthy that the profit margins for some American Crop Protection Distributors in dropped by -2% to -3%. Similarly, the percentages indicated in the USA have been found corresponding to that of Crop Protection Distributors in South Africa. The continued increase in the cost of product handling, increase in product prices from supplier level, and the decrease in profit margins (growers’ low-cost provider focus) remain a challenge to Crop Protection Distributors. They have limited room for error to stay sustainable (Sfiligoj, 2017).

We have seen dozens of Crop Protection Distributors and particular cooperatives who have exited the industry via sale or acquisition (Sfiligoj, 2017). The significant consolidation amongst Multi-National Crop Protection Manufacturers from the Big 6 to the Big 4, and later the merger between two major state-owned China Crop Protection Manufacturers ‘ChemChina’ and ‘Sinochem’ in September 2020 is confirmed (Jia, 2020).

New start-ups have popped up, such as Farm Trade and Farmers Business Network (FBN), where these companies sell products directly to growers at a set cost via an e-commerce model. This business model has taken the space of approximately 15% to 20% of a specific market segment where growers focused on the lowest-cost provider (Sfiligoj, 2017).

It is assessed that the Amazon-type e-commerce model could occupy at least 10% of the total market penetration and might fail on a large scale due to the demographics of the market and its segments. It is further argued that this model might fail on a large scale as Crop Protection Distributors still have an amount of knowledge and trust in agriculture which will be required from growers.

Crop Protection Distributors are warned not to follow old business models. If they do not adapt to the growing needs and wants of the growers who face their profitability concerns, new start-ups like FBN will make inroads and occupy an even higher market share (Sfiligoj, 2017).

There is no doubt that e-commerce will come to agriculture, although not evident in South Africa yet; this is a portion of the market that will be occupied similar to those experienced by the USA. The question is not whether this model will be adopted, but rather based on the experience in the USA and the specific segment it targeted, the question targets who will be the first mover to take this space, and how should it be adopted, learning from the experience in the USA. The study also aims to assess that the e-commerce model should be implemented based on the research data obtained from the growers.

It was noted above that the profitability of the Crop Protection Distributors in South Africa are under strain. The continued decline in the profits, 2% to 3%, one can argue that most Crop Protection Distributors swim in a red-ocean where competition is fierce, bloody and products and services offered are commoditised.

This study aims to advise IntelliGro on how to develop a Blue Ocean Strategy following the Six Path Framework, as well as develop a “*Value Curve*” which is designed to be able to show the organisation instantly where **value** is created from the IntelliGro product and services in each of the segments. The “*Value Curve*” will then graphically illustrate the way IntelliGro or the Crop Protection Industry configures its growers’ offering.

A Blue Ocean Strategy alone will not suffice as any organisation is required to be able to swim successfully in both the red-ocean as well as balance their Blue Ocean Strategy (Chan Kim & Mauborgne, 2005a). It is thus imperative that Crop Protection Distributors understand that in a world where new active ingredients and molecules are regarded as super-star products, marketing has been slow and far in-between. This is, mainly due to the regulatory environment and the excessive cost to develop one new active ingredient, which exceeds \$350 million and takes 11 years from the identification of the new molecule until the stage where it can be marketed.

There are significant commodity and post-patent Crop Protection Products and Crop Protection Distributors who need to adapt their service offering to create value, follow a low-cost provider strategy in a red-ocean market, and aim to following a best-cost provider strategy in the blue ocean. It is only through increased market share that red-ocean strategies and reduction in logistics and handling of the product that Crop Protection Distributors will increase profitability, should they not follow a Blue Ocean Strategy.

The research study aims to develop segment-specific business models for Crop Protection Distributors in South Africa. We deliberate the problem statement below that the business models for Crop Protection Industry have not changed since its inception in the early 1990s.

The market is 100% the Crop Protection Distributors to lose due to level of trust and knowledge which exist. To remain sustainable Crop Protection Distributors (like InteliGro) must do their part to keep their growers/customers through a successful business model generation which is focused on addressing the growers' needs and wants.

1.2 PROBLEM STATEMENT

The Crop Protection Distribution Industry in South Africa has not seen significant changes since the business models established in the early 1990s. Manufacturers' business model was 1) to divest their direct distribution into selected distributors and 2) their marketing role has developed to convince the Distributor to buy their products compared to other manufacturers (Schreuder, 2002).

Crop Protection Distributors' business model focused on the appointment of affiliated, commission-based agents in various localities/towns, where the agent acts as an independent contractor.

This contractor enters into an exclusive or semi-exclusive distribution agreement with the Distributor, to promote, sell and distribute the products from the Distributor, who in return has established agreements with Manufacturers. It is noted that this specific business model, since its establishment in the early 1990s, has remained the primary model to the end-user (producer/farmer).

Agriculture faces numerous challenges these days, most notably the worldwide key challenge of providing a sustainable food supply with agricultural systems to a population that is expected to grow to 10 billion by the year 2050. The report clearly states that “business as usual” by all stakeholders should be critically assessed to address major transformation in agricultural systems, rural economies and natural resource management.

The global impact on agriculture will no doubt have a contributing factor and impact on South Africa, as the research into the Crop Protection Industry is specifically limited in South Africa.

In South Africa, there has been an increase of 64% in affiliated commission agents (employed by Distributors). In contrast to the above, in South Africa crop-focused producer/farmer numbers continue to decrease from 60 000 (1996), 45 000 (2002), to less than 40 000 (2009). The projected number of remaining farmers is 15 000 by the year 2027.

Research conducted in 2016, B2B: A paradigm shift from Economic Exchange to Behavioural Theory: a quest for better explanations and predictions indicated that a great majority of B2B firms reach their customers through various channels of distribution. ***These channels are constantly evolving.***

The study aims to critically assess the current business models of Crop Protection Distributors in South Africa as a generic template/business model. The research will then focus on rigorous analysis of the requirements (needs and wants) of the producers/farmers in South Africa. Based on the responses received from the research, optimal segment-specific business models (compared to the generic business models) will be formulated and proposed for implementation.

In the research conducted by (Schreuder, 2002) it is recommended that further research is required into Corporate Agricultural Business service models and processes.

It has been mentioned that no significant changes in the current business models used by Manufacturers and Distributors of Crop Protection Products in South Africa have occurred.

1.3 RESEARCH QUESTIONS AND RESEARCH OBJECTIVES

The problem statement above noted that the business models in the South African Crop Protection have not adapted since its inception in the early 1990s. To ensure its sustainability and relevance in the future, Crop Protection Distributors (LaPlaca & Da Silva, 2016) must gain a greater understanding through research to verify:

1.3.1 Primary research question

What will be the optimal business model per grower segment which should be developed and adopted by Crop Protection Distributors in South Africa to address the requirements (needs and wants) of the customers in those specific segments?

This primary question culminates from the three sub-research questions below:

- What are the needs and wants of the growers per segment, how do they make their buying decisions and what are those pertinent issues that are required to be met?
- What will the business models look like per grower segment based on their needs and wants?
- How will Crop Protection Distributors develop and implement these segment-specific business models in an omni-channel marketing approach?

1.3.2 Primary research objective

The primary objective of the study is to develop optimal segment-specific business models which should be implemented by Crop Protection Distributors in South Africa.

1.3.3 Secondary research objective

The following secondary research objectives are derived from the research questions above:

- i. To identify the proper segmentation profile of customers
- ii. To identify customer segmentation according to specific needs and wants

- iii. To determine whether an e-commerce business model should be adopted

1.4 RESEARCH PROPOSITIONS

The Research Propositions supporting the deductive theory of the relationship between practice, theory and research for this study are:

Table 1: Research Propositions

Description	
Research Proposition 1:	The needs and wants of each of the customer segments will differ based on the demographics, size, legalised structure, ownership % and crops cultivated.
Research Proposition 2:	The buying decisions of Crop Protection Products for each of the customer segments differ.
Research Proposition 3:	The traditional business model will apply to a specific customer segment, medium to large size commercial producers.
Research Proposition 4:	Research data, technology and industry-related information, play a significant role in the buying decision-making processes in individual customer segments and are of less importance in other customer segments.
Research Proposition 5:	The business models will differ per customer segment based on the needs and wants of each of the customer segments.
Research Proposition 6:	An e-commerce business model should be implemented by Crop Protection Distribution Companies.

1.5 CONCEPTUAL FRAMEWORK

The conceptual framework below aims to illustrate the extent to which the study seeks to address the problem statement, the primary and secondary research objectives, and the Research Propositions through empirical study.

Figure 1: Conceptual Framework of the Study



1.6 RESEARCH METHODOLOGY

1.6.1 Introduction

Research philosophy is a system of beliefs and assumptions concerning the development of knowledge. Multiple types of assumptions are inevitable in each stage during any research. These assumptions include human knowledge (epistemological assumptions), realities encountered in the research process (ontological assumptions), and the extent to which values influence the research process (axiological assumptions) (Crotty, 1998).

These assumptions shape our understanding of our research questions, the methods we use and how we would interpret our findings (Saunders *et al.*, 2016).

Business and management research is a distinctive research focus where three features are combined (Easterby-Smith *et al.*, 2012):

- Eclectic nature: knowledge developed in different disciplines, for example, sociology, geography, psychology, and economics and statistics, present their own underlying assumptions.
- High levels of education represented by employees and managers who are as well educated as those who have researched them.
- The research is expected to have a practical consequence which will lead to direct action. Actions or needs would be addressed, specifically taking the practicality of findings into account. The intent of the study and allowed access would only be pursued should there be a perceived advantage to the individuals or the organisation they represent (Saunders *et al.*, 2016).

The nature of management research has had an empirical focus which is both theoretically and methodologically rigorous while embracing practical relevance and applicability in the world of practice. The nature of the business and management research can be debated where the findings should not only address the needs to advance knowledge and understanding, but it should also address organisational and managerial problems (Saunders *et al.*, 2016).

(Denyer & Tranfield, 2009) referred to the above as the so-called “relevance gap” and stated that ignoring the “relevance gap” would be atrocious in other professional fields (i.e. medicine, engineering). It would compare to a national scandal if science and practice were not inextricably interlinked. Management research is conceptualised as a design science and not social science (Saunders *et al.*, 2016).

This relates to the idea of conceptualising management as a design science rather than social science. From the design science perspective, the primary purpose of academic management research is only to develop valid knowledge in support of organisational problem-solving. The counter-argument proposes that management practice is characterised by a wide variety of organisational phenomena that are often ambiguous.

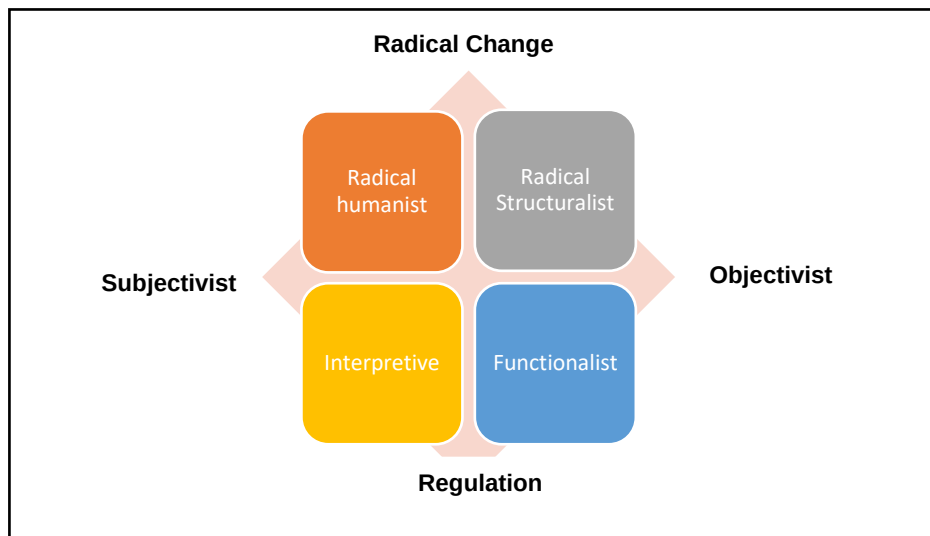
Therefore it may not be suited to rule-like explanations offered by design science, and there needs to be a balance between explanation and application (Pandza & Thorpe, 2010).

This research is undertaken within InteliGro (individual organisation), to understand the current business model (divesting of distribution through the appointment of affiliated commissioned agents) applicability and whether this business model is suited for different segments. Through the study we aim to understand what the business models for each of the customer segments should be based on their needs and wants. Furthermore, to advise whether InteliGro should adopt different business models for each of these segments, and to propose how those business models should look to address value innovation and value proposition, in the quest to ensure that InteliGro remains relevant and sustainable in the future. It was noted in the problem statement above that the business model for Crop Protection Distributors in South Africa had not been changed since its inception in the early 1990s.

The research will follow a **radical change perspective**, as suggested by Burrell and Morgan, (1979). Organisational problems or burning points are approached through Radical Change Research to overturn the existing business models or make fundamental changes to address value innovation and follow a blue ocean marketing strategy. Radical change research approached organisational problems in an attempt to overturn the status quo. This research is often viewed as visionary and utopian while being concerned with what alternatives exist and what possibilities could be implemented to change the current position (Burrell & Morgan, 1979).

Burrell and Morgan in their book, *Sociological Paradigms and Organisational Analysis* (1979), combined the objectivist-subjectivist continuum with a regulation-radical continuum in an attempt to create a matrix of the four major and rival “paradigms” of organisational analysis, as seen in Figure 1.2 below. The matrix below illustrates the four different views of the social and organisational world. This study focusses on the combination between the **functionalist - and radical structuralist paradigm**. This paradigm is best suited and used most business research projects. This study is also concerned with rational explanations in the evaluation of current business models (**functionalist**), and aims to develop a set of recommendations for new business models to be implemented per segment. These recommendations are based on the needs and wants of each of the customer segments (**radical structuralist**), while remaining focused on the study with objectivist continuum.

Figure 2: Four paradigms for organisational analysis (Burrell & Morgan, 1979)



The study will follow the positivism research philosophy where typical methods include deductive, highly structured, large samples, measurement, quantitative method of analysis, and range of data can be analysed (Saunders *et al.*, 2016). A positivist natural science will be drawn (Research Propositions formulation) in the engagement of the world we live in, as part of InteliGro and as a Crop Protection Distributor in South Africa.

As a positivist the researcher will remain neutral and detached from the research to avoid influencing the findings (Crotty, 1998). This was achieved by using questionnaires sent from the IT Department through the use of SurveyMonkey (Internet Questionnaire). Here the respondents will receive an electronic link to the questionnaire, which they were required to complete in their own time.

The use of SurveyMonkey is specific to remain external to the process of data collection. SurveyMonkey itself collects the data, so the researcher is unable to alter the substance of the data collected (Saunders *et al.*, 2016). The study will also follow a highly structured methodology to ensure replication (Gill & Johnson, 2010).

1.6.2 Research design and method of data collection

1.6.2.1 Research design

The study will follow a literature study as well as an empirical research study, as illustrated in the conceptual framework above.

The research approach adopted is a quantitative study in nature, where quantitative research is described as a distinctive approach where data is collected. The relationship between theory and the research conducted was viewed as deductive (Bryman *et al.*, 2014).

A quantitative research design may use a single data collection technique, such as a questionnaire, and a corresponding quantitative analytical procedure. This is known as a **mono-method quantitative study** (Saunders *et al.*, 2016).

The researcher has considered the practical consequences of the study and moved from basic research to applied research (refer to Table 1.2 below). At the end of the applied research, the research is direct and can be used immediately by managers. The research addressed important issues and was constructed in ways that can be understood by managers and be implemented accordingly. This is the basis of **applied research** (Saunders *et al.*, 2016).

Table 2: Basic and Applied Research (Easterby-Smith *et al.*, 2012)

Basic Research ←	→ Applied Research
<i>Purpose:</i> • Expand knowledge and processes of business and management • Results in universal principles relating to the process and its relationship to outcomes	<i>Purpose:</i> • Improve understanding of particular business or management problem • Results in solution to the problem • New knowledge limited to problem • Findings of practical relevance and value to managers in the organisation
<i>Outcomes:</i> • Undertaken by people based in universities • Choice of topic and objectives determined by the researcher • Flexible time scales	<i>Outcomes</i> • Undertaken by people based in a variety of settings including organisations and universities • Objectives negotiated with the originator • Tight time scales

1.6.2.2 Research strategy

The research strategy, as defined by (Denzin & Lincoln, 2011), plans how the researcher will aim to answer their research question. It will be the methodological link between the research philosophy and choice of methods to collect and analyse the data. The research strategy is discussed below, which will follow the construct of:

- Data collection
- Reliability and validity of the research
- The Sampling Process
- Sampling Strategy
- Research ethics

1.6.2.3 Data collection

The data collection will follow a survey strategy to associate with the deductive research approach. The survey strategy is used to answer 'what', 'who', 'where', 'how much' and 'how many' questions (Saunders *et al.*, 2016).

In this specific study, the aim is to understand what the needs and wants of the growers are in specific segments and to develop segment-specific business models to be implemented by Crop Protection Distributors in South Africa.

The study follows a cross-sectional design use of questionnaires. The questionnaires are designed to follow a quantitative research approach, and will follow the construct of:

Question 1:	Approval / Consent to the research
Question 2:	Information about the person completing the questionnaire
Question 3 – 13:	Information and segment-specific questions
Question 14 – 21:	Procurement patterns and which factors influence the decision-makers in their choice of procuring Crop Protection Products based on the needs and wants of each of these respondents
Question 22 – 23:	To determine to what extent the respondent will consider e-commerce and what will be the primary objective, should this business model be considered
Question 24 – 25:	Segment-specific importance to access latest technology and information
Question 27 – 28:	Which segment provides the biggest appetite to integrate backwards with their Crop Protection Distributor and what will be their primary objective in considering backwards integration.

The questionnaires were compiled by reviewing past theses and dissertations, as well as with the support of Mr R. Geldenhuys and the promotor Prof. C. A Bisschoff, to ensure that the questionnaire is complete and will address the primary research objective. The following literature was reviewed:

- 2017 Victor Harbor Agri-business Survey Key Findings Report (Harbour, 2018)
- The Impact Of Changes In Corn Prices On Pesticide Demand (Vermeulen, 2008)
- Agricultural Sample Survey 2010 (Africa, 2018)
- An Investigation Into Global Distribution Systems In The Crop Protection Industry And The Development Of Distribution System Management Models For Particular Application in South Africa And Australia (Schreuder, 2002)

- Inclusive Business Models (FAO, 2017b)
- Business Characteristics and Business Model Classification in Urban Agriculture (LIU, 2015)
- Technology Transfer as a Driver of Innovative Entrepreneurship in Agriculture and the Agri-Food Industry (Chania, 2015)
- Business Model for Sustainable SMME Pig Farming in the Central Free State of South Africa
- Farmer Survey (Kingsley, 2016)

The questionnaires will be developed and formulated in Word format and transferred to SurveyMonkey, which is an internet research site designed specifically for internet questionnaires and data collection. The link to the questionnaires will be sent from the IT Department of the IntelliChem Group to all the respondents. See Appendix A for the sample of the questionnaires sent out.

Once the questionnaires have been completed, the data will be exported from SurveyMonkey to an Excel format. This document will then be sent to the North-West University's Department of Statistical Consultation Services, to analyse the data obtained. The analysis, once completed, was sent to the researcher to interpret the results as part of the study.

1.6.2.4 Reliability and validity of research

Reliability and validity are crucial to the quality of the quantitative research in the social sciences and the judgements made. Reliability was judged against the replication and consistency of the research.

The research will only be considered reliable if the research design and study can be replicated, and the same findings could be achieved. It would be found that the study could be replicated should the same questionnaire be sent to various growers in South Africa. The findings would be the same as it relates to those growers' specific needs and wants, as based on their profile, demographics, size and crops cultivated.

The validity of the research is addressed through the appropriateness of the measures used, the accuracy of the analysis of the results and the interpretation of the findings (Saunders *et al.*, 2016).

- 1) *Internal validity*: would be addressed where the questionnaires aim to obtain relevant segmentation data, as well as real and causal relationships between factors which impact the decision-makers in their procurement of Crop Protection Products per segment. These differ based on their needs and wants and can develop segment-specific business models. These relationships will be analysed and associated with an analytical factor commonly associated with positivist and quantitative research, which is the design of this study.
- 2) *External validity*: this study aims to address external validity through the data collected and analysed, along with the subsequent segment-specific business models to be developed for Crop Protection Distributors in South Africa. It will not only be applicable and adopted by InteliGro, but aim to be a model for specific segments which can be adopted by all Crop Protection Distributors in South Africa. These business models will be developed based on the needs and wants of those growers in that specific segment.

1.6.2.5 The sampling process

In selecting a sample to study, it should represent the full set of cases/population in a way that is meaningful and which we can justify (Becker 1998).

The selected sample relates to the target population highlighted from the research questions and objectives. The target population is defined as the actual focus or target of research enquiry (Kervin 1999). In this research, the target population is the customers of InteliGro, which is 2 018 active customer accounts. The focus of the study is to obtain a rigorous analysis of the business models which should be adopted, based on the needs and wants of the InteliGro customer segments, and compare it to current business models adopted by InteliGro.

The population above consists only of commercial farmers cultivating crops (for example citrus, grapes, vegetables, summer row crops, small grain, potatoes and minor crops). The study focuses on new business models for input suppliers like InteliGro (National Distributor of Crop Protection, specialised plant nutrition, biological solutions and technology products) and Villa Crop Protection (National manufacturer of Generic Crop Chemical Products).

The study and selection will aim to include commercial farmers cultivating the same crops in different provinces (such as a citrus farmer in Limpopo's response to the questionnaire and future requirements might differ from a citrus farmer in Eastern Cape and/or Western Cape). Geographical information and patterns were assessed to strengthen the required new business model per segment, per commercial farmer demographics and cultivated crops.

The study aims to provide insight into determining what new business models should be used for the following type of commercial farmers:

- Segment 1: Corporate Agricultural Businesses (where commercial farmers are integrated into the value chain, either forward or backward integration)
- Segment 2: Mega-Sized Commercial Growers (the basis of turnover, differentiation in crops cultivated, legalised structure, the investigation into integration)
- Segment 3: Medium and Large Sized Commercial Growers (the basis of turnover, limited differentiation in crops cultivated, and no integration into value chain)

1.6.2.6 Sampling strategy

The study followed a probability sampling strategy which is most commonly associated with survey research strategies. This study aims to make inferences from the sample selected about the population of growers to answer our Primary Research Questions and to meet the primary and secondary research objectives (Saunders *et al.*, 2016).

The probability sampling process can be divided into four stages:

- 1) Identify a suitable sampling frame: customers in the IntelliGro Database, which is demographically located throughout South Africa, this customer base was selected based on our research question and objectives.
- 2) Determine what the suitable sample size should be.
- 3) Selection of the most appropriate sampling technique and start to select the sample.
- 4) Ensure that the sample is representative of the target population, so the sample at least addresses growers from each of the segments which we will be focusing on.

It is of utmost importance that the sampling frame for any probability sample should represent a complete list of all the cases in the target population from which the sample was selected. The target population, as highlighted above is the Customer Database of IntelliGro, a single organisation who is a National Crop Protection Distributor in South Africa.

As highlighted by (Edwards *et al.*, 2002), when the sampling frame is from an existing database, one should be cautious that the database is often incomplete, the information might be dated.

In address the concerns noted by Edwards *et al.* (2002), the sample selected was sent to the various Crop Solutions Specialists who serve these growers, to obtain the correct information (such as the name of the producer and e-mail address) before any of the questionnaires was dispatched to the sample.

1.6.3 The decision on a suitable sample size

To draw conclusions and to develop segment-specific business models, the generalisations about the target population from the data collected must be statistically probable. The sample size chosen was based on:

- The level of confidence we need in the data collected: we need to achieve a 95% certainty that the characteristics found in the data represent 100% of the population in that segment and a margin of error which we can tolerate.
- The types of analyses we are going to undertake, in particular as seen below from Section 1 to Section 6 in the results, where many statistical techniques were used in each of the sections.
- The size of the target population.

The sampling frame was derived from the target population where the growers in the database were reduced to:

- 1) Exclude own Crop Solution Specialist accounts
- 2) All-cash sales
- 3) All sales below R500 000 to any grower for the period of 1 August 2019 to 31 July 2020.

The sampling frame then constituted 697 growers.

The sampling frame was then categorised to determine the relevancy of the sampling frame to include all the categories (for example, Corporate Agri-Business, Mega-Sized Commercial Growers, Medium - and Large Sized Commercial growers).

The following sample frame per category was derived:

Corporate Agri-Business:	55 growers
Mega-Sized Commercial Growers:	113 growers
Medium and Large Sized Commercial Growers:	529 growers

1.6.4 Determining the Sample Size Required

Probability sampling requires that the sample size be large enough to have the required confidence in the data collected. Based on the literature of research methods as presented above, we need a 95% certainty that our business model development for specific segments is accurate. This corresponds with a z-score of 1.96. An estimate that the margin of error should be within acceptable limits, a 5% of the true percentage. This requires one to estimate what the response rate will be of the sample selected. The sample size required was calculated as follows:

$$n = r\% \times q\% \times [z / e\%]^2$$

where:

n = minimum sample size

r% = Percentage belonging to the specified category (697 / 2081) = 33.5%

q% = Percentage not belonging to the specified category ((2081 – 697)/ 2081) = 66.5%

z = level of confidence required (@95% = z: 1.96)

e = margin of error (5%)

Total accounts in IntelliGro Database = 2 081

$$n = 33.5 \times 66.5 \times [1.96 / 5]^2$$

$$\underline{n = 342}$$

The minimum sample rate will be used as guidance where the actual sample size is shown in the table below.

Table 3: Actual sample size

	Corporate Agri-Business	Mega-Sized Commercial Growers	Medium and Large Sized Commercial Growers	Total
<i>Sample</i>	55	113	250	418
<i>Sampling Frame</i>	55	113	529	697
<i>Sampling %</i>	100%	100%	47% - systematic random	

The sampling technique used and determined as the most appropriate, only referred to the Medium and Large Sized Commercial Growers category. Here the researcher adopted a systematic random approach by starting at a random point in the database and then selected every second grower in this segment from the sample frame.

1.7 DEMARCATION OF STUDY

1.7.1 Geographical considerations of the unit of analysis

The unit of analysis consists of the Client base of IntelliGro, numbering 2081 commercial growers throughout South Africa, including all the provinces. The study uses a cross-sectional internet questionnaire which was be sent from IntelliChem's IT Department to all the growers in the sample selected, to their personal or business e-mail accounts. The respondent will have the opportunity to access the questionnaire via the internet through the portal provided by SurveyMonkey.

1.7.2 Permission to access client base:

IntelliGro permission has been granted as they are involved in the funding of this study (See Appendix).

1.8 SUMMARY

The study will follow the positivism research philosophy where typical methods include deductive, highly structured, large samples, measurement, quantitative method of analysis, and the range of data can be analysed (Saunders *et al.*, 2016).

The research approach adopted is a quantitative study in nature, using the mono-method quantitative study. Considering the practical consequences of the research, the research is constructed more towards applied research, specifically to be implemented and presented in such a manner which can be used by managers in an organisation.

Internal and external validity limitation and concerns were adequately addressed in the demarcation and sampling strategy. This enables the researcher to not form any biases or involvement, which may impact the quality of the research results.

CHAPTER 2: CHALLENGES AND TRENDS IN CROP PROTECTION INDUSTRY

2.1 INTRODUCTION

The literature study below aims to provide a framework of the challenges and trends in agriculture, the Crop Protection Industry, Crop Protection Distribution, and Business Models implemented in the Crop Protection Distribution Industry. The literature study also provides an insight into looking forward past the COVID-19 pandemic in the Crop Protection Industry, and what will be required for companies to remain sustainable. The literature study will continue to focus on providing a possible solution looking into value innovation as a concept for Crop Protection Distributors who struggle to maintain profit margins as they continue to decline and threaten their profitability.

The introduction below will focus on the paradigm of why agriculture is in a worse shape than we think. The impact of climate change has been well documented. The impact thereof has been on the agenda of basically every well-known forum in the world, and has been on the agenda and focus of the World Food and Agriculture Organisation for more than a decade. Much has been done to turn the devastating impact of our industrialisation era to be greener and more environment-friendly, to slow down the impact of climate change.

We are still experiencing the effect of climate change on water and water-management practices. It will continue to shape agriculture and particularly its production stage, where water will influence the selection of a specific crop, cultivar and the technology employed (Ungerer *et al.*, 2018).

Agricultural production and the impact on land use has been a major role player in the levels of anthropogenic emissions of greenhouse gasses. Record levels are recorded according to the most recent assessment report of the Intergovernmental Panel on Climate Change. The impact of climate change is expected to be the most adverse in the low- to middle-income countries, not assisting the current demand on food supply to feed the growing population, especially in those countries where food insecurity is ranked at the top (FAO, 2017c).

Deglobalisation is a reality due to the trade wars experienced between China and the USA. The USA is aiming to move supply chains out of China back into the USA, in order to find lower alternatives or to use automation to reduce costs. China is seeking to move out of its dependence on the USA dollar grip and clean up its environment while focusing on their new middle-class consumers (the predominantly USA dominated technology markets). Each of these countries plays a significant role in the global economy, and various countries are linked with either or both. For the Crop Protection Industry, China plays a massive role in the production of raw synthetic agrichemical material. At the same time, the environmental clean-up has caused disruptive supply chain management in agriculture on an on-off basis. The trade wars are by no means over, and the impact of this relationship will affect agriculture (Budzynski, 2020).

Some of the most pressing matters focused on in all major agendas impacting the future of agriculture include (FAO, 2017c):

- a) The food crisis which is looming, where we aim to address food insecurity and address the demand to feed a growing population which has been estimated to reach 10 billion by the year 2050.
- b) The economic insecurity of the United States due to the trade wars and deglobalisation. The trade wars not only had an impact on the sales volume but also the price. The prices for soybeans averaged at \$10 to \$12 per bushel. With the ongoing trade wars, this price declined by 15% to 30% over the period to \$8.71 per bushel.
- c) The ongoing closure of food processing facilities and local businesses which was caused by the COVID-19 pandemic. The worldwide impact of the pandemic on the economy and especially those developing/emerging countries, which includes South Africa.
- d) High rates of food waste aiding the threat and intensifying food insecurity. The Food and Agriculture Organisation (FAO) of the United States estimated that a total of 1.3 billion tonnes of food is wasted globally per annum, which represents one-third of all the food which is produced for human consumption.

- e) Disruptions in trade networks and the fluctuation in the global demand for agricultural products. This concerns the green revolution and the added pressure to produce residue-free food with reduced Active Chemical Ingredients to effectively implement Integrated Pest Management Practices. The closure of Crop Protection Formulation companies in China due to non-compliance to the new environmental laws have placed immense pressure on the trade networks for Crop Protection. The COVID-19 pandemic also did not provide us with relief, where the closure of certain businesses and ports had a massive impact on the supply.
- f) We noticed the economic depreciation worldwide. We continue to notice it not only in South Africa due to the climate changes and prolonged drought experienced in certain areas, but worldwide, where the farming debt increases by 20% per annum over the past decade and producers need to grow more on the same land to remain sustainable.
- g) Today the global debt is amounting to \$250 trillion, which represents 320% of the GDP. The extreme price appreciation of new technology and new farming equipment at levels of more than double inflation cripples the producer. Without the adoption of the latest technology and new implements (with specific reference to precision agriculture), they will not be able to produce more food more efficiently and cost-effective.
- h) The prices for agricultural land are levitating above what the farm's economy can justify, due to acquisitive farmers diluting their respective balance sheets. Meanwhile, those who are non-farmers are looking for investment into farms that provide a significant return with low risk.

2.2 PROBLEM STATEMENT

It is clear from the introduction that the challenges in agriculture will require the strategic ideation of all input suppliers and growers to combine efforts to ensure that growers produce more on less arable land, more efficiently and profitably. For strategic ideation to occur, input suppliers (like Crop Protection Suppliers) need to continually seek opportunities for collaboration with growers to understand their needs and wants.

Collaboration and a new model which needs to be investigated guarantees recommendations provided for product supplied, as well as collaboration with the growers on the procurement of bulk supply/containers. The value creation for Crop Protection Distributors will be of utmost importance should they wish to remain sustainable. The value that is created needs to be communicated and articulated that it indeed addresses the needs and wants of the growers.

2.3 RESEARCH PROPOSITIONS

The Research Propositions formulated in Chapter 1 is supported with the introduction and the problem statement above. It is aimed at the needs and wants of growers for each specific segment, which will differ based on their demographics, size, profile, legalised structure, owner/management decision-making and crops cultivated. Their needs and wants differentiation will be reflected in the buying decisions factors they deem most important, which will be segment-specific.

The Research Proposition is that the factors and challenges noted above will influence each segment differently, as some of them will be subsistence-based and others significantly cost-focused.

2.4 RESEARCH METHODOLOGY

In the introduction in Chapter 1 of the research methodology, we explained that the research will follow a **radical change perspective** according to (Burrell & Morgan, 1979) and will follow a positivism research philosophy, where typical methods include deductive, highly structured, large samples, measurement, quantitative method of analysis, and range of data can be analysed (Saunders *et al.*, 2016). As a positivist natural science will be drawn (Research Propositions formulation) in the engagement of the world we live in, as part of InteliGro and as a Crop Protection Distributor in South Africa which is seen in the conceptual framework.

The research approach adopted and aligned with the positivism research philosophy is a quantitative study in nature, and the single data collection technique (through the use of cross-sectional questionnaires) will be a **mono-method quantitative study** (Saunders *et al.*, 2016).

The data collection will be done using cross-sectional questionnaires which will be distributed to the sample selected through the internet source SurveyMonkey.

Reliability and validity are crucial to the quality of the quantitative research in the social sciences and the judgements made. Reliability is only judged against the replication and consistency of the study.

The validity is addressed by determining the appropriateness of the measures used, the accuracy of the analysis of the results, and the interpretation of the findings (Saunders *et al.*, 2016).

The sampling process provided insight that the sample for the study will be represented by the full set of cases/population in a way that is meaningful and which can be justified in accordance to (Bekker, 1998).

The sampling strategy followed was chosen to be a probability sampling process where we moved through the four stages to ensure the completeness of the sampling strategy. The sample frame derived from the population was critically assessed against the basis that it does contain all the elements required to make assumptions based on the probability of the sample selected.

The sample size was calculated to achieve a 95% probability that the characteristics found in the data represent 100% of the population. The margin of error tolerated was, as suggested by the literature, 5%. The minimum sample size calculated amounted to 324. However, we explained that the sample size was calculated at 418. This sample represents the minimum sample rate, which was used as guideline to determine the actual sample size (see Table 4):

Table 4: Actual sample size

	Corporate Agri-Business	Mega-Sized Commercial Growers	Medium and Large Sized Commercial Growers	Total
<i>Sample</i>	55	113	250	418
<i>Sampling Frame</i>	55	113	529	697
<i>Sampling %</i>	100%	100%	47% - systematic random	

The sampling technique used and determined as the most appropriate, only referred to the Medium and Large Sized Commercial Growers category. We adopted a systematic random technique, where every second grower in this segment was chosen randomly from the sample frame.

2.5 LITERATURE STUDY

The purpose of scientific investigation is to advance our knowledge and understanding of the world around us. In conducting scientific investigations, researchers, particularly scientists studying physical phenomena, progress through a hierarchy of types of research: descriptive, explanatory, predictive and control (Vidickiene & Gedminiute-Raudone, 2018).

2.5.1 Challenges facing Crop Protection Industry

Agriculture faces several challenges these days. Most notable is the worldwide key challenge of providing sustainable food supply and agricultural systems to a population that is expected to grow to 10 billion by the year 2050 (FAO, 2017a). The report provides further insights into the top ten challenges in achieving food security and nutrition for all and making agriculture sustainable.

The report clearly states that “business as usual” by all stakeholders should be critically assessed to address major transformation in agricultural systems, rural economies, and natural resource management.

Management of our natural resources adds to the challenge as we are required to produce more food on the 3.5% arable land (1.5 million hectares of land used for farming)(FAO, 2017a). Commodity prices are currently at a low, where corn prices in 2008 were \$8 per bushel, while in 2016, they were \$3 per bushel (Sfiligoj, 2017). These prices result in further pressure on producers not only to produce more but to do so in a sustainable, profitable manner. Climate change is also a growing risk determinant to Corporate Agricultural Businesses (Vidickiene & Gedminiute-Raudone, 2018).

Precision Agriculture and the adoption of technology in agriculture has received immense focus by input suppliers and is identified as a significant trend. Precision Agriculture, as an Integrated Pest Management Control tool, can meet much of the increasing environmental, economic, market and public pressures on arable agriculture (Stafford, 2000).

Producers facing the challenges are increasingly looking for answers from Multi-National Research-based Crop Protection and Seed Companies to aid them in the management of resistant and aggressive pests/weeds which threaten the crops and income of the producer. The demand for Research and Development has heightened (Xie, 2017).

Regulation has placed immense pressure on new product development costs for both seeds and chemicals. The range is \$300 million to \$500 million in development and research, taking approximately 11 years (Sfiligoj, 2017). The number of new molecules released annually on the market has been declining for decades (Xie, 2017).

The overhead costs for new product development with additional pressure from growers with the reduced commodity prices have resulted in mega-mergers from the Big 6 Multi-National Crop Protection Suppliers to the Big 4.

It also seems that political and social pressure flaws pure science (Carroll, 2017), specifically in countries moving to more healthy food (Wiebe *et al.*, 2011). This results in pressure to restrict/ban the use of neonicotinoids and weed control chemicals such as paraquat and glyphosate.

The impact on agricultural productivity through restrictions of neonicotinoids is reported to be 912 000 tons of oilseed rape annually in the UK, and loss in Europe to the value of 900 million Euro. Neonicotinoids contribute to an annual crop volume of 21 to 31mn tons in the EU, worth a farm income of Euro 3 to 4bn per year (Adas, 2016). This impact on pest management due to these restrictions has resulted in an increased producer cost (Kim *et al.*, 2017).

The Crop Protection Industry faces additional challenges in their quest to maintain sustainability and to assist in providing food security in collaboration with producers. These challenges include, as mentioned above, the reduction in commodity prices, reduced new patented crop protection products due to significant pressure on new product development, consolidation in suppliers, and profitability of producers.

Strategic Ideation will be required for input suppliers and all stakeholders in agriculture to face the challenges in the future. The shift to more advanced types of research has not been as pronounced as one would expect (LaPlaca, 2014).

Improved understanding and predictive capabilities will reduce errors in strategic ideation and marketing. This will improve the overall marketing effectiveness, sustainability and what will be required by input suppliers in the future relating to B2B marketing (LaPlaca & Da Silva, 2016).

The dynamic in agriculture in the next century will require significant thought and detailed research. It must address the need to supply more food on the same arable land for a growing population, comply with regulatory requirements on product development and restrictions on neonicotinoids and other weed chemicals, absorb costs for new product development, as well as assist producers in adopting precision agriculture and required technology.

The global impact on agriculture will no doubt be a contributing factor and have an impact on South Africa, as the research into the Crop Protection Industry is specifically limited in South Africa.

2.5.2 Challenges facing Agricultural Crop Protection Distributors

The Crop Protection Industry faces additional challenges to remain sustainable and to assist in the quest to provide food security in collaboration with producers. These challenges include, as mentioned above, the reduction in commodity prices, reduced new patented crop protection products due to significant pressure on new product development, consolidation in suppliers, and profitability of producers.

It is necessary to know that while the post-war era of discovery and commercialisation was a period of continuous innovation to understand the dilemma. No new mode of action has been introduced to the market for the past 30 years. Neither product innovation based on a long-term research project with uncertain outcomes nor strategic vision were primary concerns, unlike competitive costs structures (Teicher, 2018).

The agrarian sector only experienced a real revolution in developing countries due to the widespread mechanization, electrification, irrigations and chemisation of agricultural processes (Clénies-Ross & Hildyard, 2013).

In the uncertain and globally competitive world of crop protection, it is noted that companies and organisations who do not focus and prioritise strategic vision, will no longer exist in the future and will be replaced by those who have prioritised strategic vision.

It is stated that the Crop Protection Industry (combining conventional chemical as well as biological) will be required, like the agile computer industry, to shift focus from product to implementation, and this will be based on strategic ideation (Teicher, 2018).

The opinion of Vidickiene and Gedminaitė-Raudonė (voiced in their article *Challenges for Agricultural Policy in the Service-Driven Economic System*) is that companies who prioritise and address strategic ideation should respond to the challenges of the post-industrial society in agriculture by gradually changing the focus on product-driven business models into a service-driven business model.

Research has been conducted in 2016, B2B: A paradigm shift from Economic Exchange to Behavioural Theory: a quest for better explanations and predictions (LaPlaca & Da Silva, 2016), in their research they indicate that a great majority of B2B firms reach their customers through various channels of distribution which are continually evolving (Olsson *et al.*, 2013).

2.5.2.1 The paradigm of trust in the channel

Research is required to be updated into different channels and possibilities. Independent channel (seen in distributors employing affiliated commission agents) performance is impacted by the trust. Olsson *et al.* (2013) has shown that despite increasing levels of disintermediation, distributors can obtain value from their business partners by adapting to changing market conditions.

The introduction above and problem statement indicated that the South African Crop Protection Distribution had not seen any significant changes in its current business model, where affiliated commissioned agents are employed and are the direct channel to the producer.

It should also be noted that the entry to the market for this specific sector is of ease and the growth in the number of affiliated agents, according to Croplife, is increasing with little to no significant degree or qualification, other than successful online completion of the AVCASA course. This does place doubt in the quality and profile of some of the affiliated commissioned agents in the industry. Lisa Heacox states in an article called *Future Direction for Ag Retail* (Heacox, 2017) that distributors in the next few years need to take their affiliated commission agents, and their status as a trusted business advisor, to new and higher levels in several areas.

Distributors and affiliated commission agents will need to get producers away from focusing only on increasing the yield per hectare, but also on the return of that crop (i.e. develop a mindset of return on investment) (Heacox, 2017). Through focused return on investment initiatives of farms, the producers will become increasingly profitable and address insecurity regarding sustainability.

The role of trust in various channels of distribution needs to be studied and understood, as it evolves with time and across different geographies and carries differing degrees of importance, depending upon the cultural context in question (LaPlaca & Da Silva, 2016).

2.5.2.2 Crop protection distribution trends

In the article by Eric Sfiligoj in Agrow, 26 September 2017 (Sfiligoj, 2017), he mentioned that dozens of retailers, particularly cooperatives, have recently exited the industry via sale or acquisition. The pressure on the producers' productivity, pressure on supplier level in line with the drop in commodity prices to reduce prices of their products, have had an impact on distributors where profit margins have dropped to 2% to 3%. If you are working on a 1% profit margin, there is not a lot of room for error (Sfiligoj, 2017).

In this age of rapidly changing and advancing technologies, Crop Protection Distributors should remain innovative to stay ahead. They should not only understand these challenges but should balance between adapting their existing strategies and practices to maintain/grow profitability. The interactions with manufacturers have become increasingly intricate. Increased pressure from producers to demonstrate value and a change in the agricultural landscape (through producer and Manufacturer consolidations) are only a few which require Crop Protection Distributors to balance (ProAgrica, 2020).

In the recent research in Ag Retail Trends (ProAgrica, 2019), ProAgrica accessed 27 000 trade connections through a survey inviting participants to open answers which reflected their true feelings. The following trends stood out from the survey, which includes the market, the supply chain, and data and analytics:

- *Retailer profitability:* Supporting Sfiligoj above, the leading concern remains the challenging trading environment, which resulted in pressure to lower prices and reduce margins. Of the respondents, 31% listed this trend as one of their biggest concerns going into 2020.

- *Workforce shortages:* It is reported that the lack of skilled labour is a concern, where 24% of the respondents indicated that this is one of their biggest problems. It is noteworthy that some questions surround the ease of entry to the Crop Protection Industry through affiliated commissioned agents who do possess the required skills, knowledge and experience for the profession, and meet the needs of the producers.

Finding affiliated commissioned agents who possess advanced skills and the required profile is becoming increasingly difficult. We have also experienced in South Africa the shortage of trained B.Sc. Agriculture candidates (“Technical Specialists”), specifically in the Crop Protection Industry, to provide the required technical support to producers and affiliated commissioned agents. The competition for both Technical Specialists and the preferred profile affiliated commissioned agents is extreme.

- *Producers’ profitability:* Producers are required to make tough decisions in their ability to spend with their Crop Protection Distributor, which resulted from the more robust competition in the market, reduced instruments, and restricted access to cash flow. The phenomena created a great deal of uncertainty in the market, where Crop Protection Distributors’ customer profile is ever-changing. Without a customer, there is no business model or sustainability.
- *Technology: How to keep up with the pace:* There is a continuous growth in precision agriculture technologies, and it is found amongst respondents that it is difficult to understand which of these technologies add value to the producer. There is pressure for Crop Protection Distributors to encourage their producers to leverage the technology to improve communication. Anxiety exists once again as to which technologies should be used and how they engage with producers to use the technology to the benefit all stakeholders.

2.5.2.3 Challenges impacting profitability

The report from ProAgrica published in 2020, *Understanding the Barriers and Opportunities for Profitability of Ag Retail*, show the following elements threaten the profitability of Crop Protection Distributors:

- *Rebate Management:* The intricate relationship within the agri-business supply chain (manufacturer and Distributor) has resulted in an increased complexity to understand the root causes of the barriers which exist in rebate management. Rebates have become a significant portion of the Crop Protection Distributors' profitability, and today more is expected from the Crop Protection Distributor in terms of each manufacturer's requirements, processes, and rules. Existing challenges are time-consuming, and require intensified human interaction in the tracking and analysing of the data for each of these rebates. The above challenges result in the inability for Crop Protection Distributors to make real-time decisions, as well as decrease operational efficiency and possible loss of rebate income due to inaccuracies (ProAgrica, 2020).
- *Inventory Management:* The continued increase of investment in infrastructure, logistics and payroll are one of the concerns to balance profitability. These efforts are necessary to ensure product placement at the correct time for producers to access. Producers are increasingly cutting costs to maintain their profitability. Inventory management through accurate forecasts for the product, based on seasonal demands, has remained a challenge and is at best 70% accurate. Joint pressure from manufacturers to increase their sales through their dedicated channels, combined with the inaccurate forecasts, results in inventory being carried over and baring financial costs to Crop Protection Distributors (ProAgrica, 2020).
- *Data Analysis:* Crop Protection Distributors operate in a volatile industry with numerous external factors. Attention should be paid to the details in data to reduce business risks and address profitability. Crop Protection Distributors should be able to work with and interpret multiple layers of data to remain profitable and improve the producers' return on investment (Heacox, 2017). Proper data analytics in Crop Protection Distribution has resulted in a lack of visibility into business-critical data, inability to identify revenue-growth opportunities, access to customer information as it is held by the affiliated commissioned agent, strategic decisions based on inaccurate data, and failure to track affiliated commissioned agents' performance (ProAgrica, 2020).

2.5.2.4 Conclusion

Supporting Delisi and Sfiligoj above, Frabotta indicated that there should be an increase and heightened use of the good agricultural practice, reliance on prescriptive agronomic recommendations, use of data-based farming and precision farming applications. Through the combined use of the above, less-developed agrarian systems can be revolutionised. Quoting and adjusting Darwin, Frabotta continues to indicate that adverse climate and devious currency fluctuations will have an impact on all businesses, and only the nimblest of companies will survive (Frabotta, 2015).

It is stated that there seems to be a lack of research on business service models and processes in agriculture. The “new producers” -generation is currently seeking alternative business models to address their sustainability, needs and requirements (Vidickiene & Gedminiute-Raudone, 2018).

2.5.3 Crop Protection Industry: Post COVID-19

The global pandemic has caused significant disruptions in the food value chain which only seems to impact Crop Input Companies in quarter 4 of 2020 or even early 2021. There has been a real product demand delay which results from two factors, namely (1) robust inventory which is currently in the value chain, and (2) the timing of the production cycles in the Northern and Southern Hemispheres which was favourable (Frabotta, 2020a).

The coronavirus had an immense impact on labour, demand trends from consumers and growers alike, logistical constraints and the consumers' ability to spend on food due to the downturn of the worldwide economy, especially those in developing countries and emerging economies. The agricultural sector was favoured as part of the essential industries around the world compared to the hospitality industry. The economic impact on Agricultural suppliers, Distributors and growers might be delayed (Frabotta, 2020a).

It would seem for now that the data is positive for Agricultural Companies, indicating that 66% of companies have met or exceeded their budget as reported in the 2020 Agri-business Global State of the Industry Survey (Frabotta, 2020a).

This corresponds to similar reports in the South African Agricultural Sector, where exports in Q3 increased 5% year on year and recorded a record US \$3.2 billion. The growth in the exports was mainly presented by citrus, wine, maize, nuts, deciduous fruit and sugar cane (Sihlobo, 2020).

While the views of the economy are more pessimistic compared to the individual company performances noted above, there is one major thing that the respondents in the survey noted, which is that consolidations, mergers and acquisitions and expansions can wait.

New product development appears to be unscathed where companies project to develop new product lines with an increased focus on biological solutions, which is not unfamiliar, given the results the agricultural sector has achieved. It should be noted that the biological product segment is the fastest-growing input segment concerning the Crop Protection Industry (Frabotta, 2020a).

Concerning the supply chains, early supply chain interruptions due to the pandemic were isolated as Crop Protection input suppliers already adopted and focused on backward integration and just-in-time delivery systems. This appeared to mitigate the risk of supply-chain disruption. These strategies continue to accelerate and would seem to be part of the “new normal” (Frabotta, 2020a).

Labour availability has been affected the most in this sector, and respondents indicated that most of them will continue to operate in some form of reduced capacity to comply with the management of the pandemic. The survey also indicated, in conjunction with the labour availability matter, that more than half of the respondents will either invest in automation or explore automation in the future (Frabotta, 2020a).

In the article published on the 5th of December by David Frabotta *A Look Back with an Eye Forward: How 2020 will affect 2021 in Global Agri-business*, he noted that it is important to force some perspective on a changing world to understand which parts of the Agri-business will normalise in 2021 and which parts of the Agri-business might be changed forever (Frabotta, 2020b).

Frabotta continues and draws attention to the supply and demand dynamics, where he emphasised that the supply and capacity are out of sync with the demand for Crop Protection Products. Here the increased commoditisation of key active ingredients, erosion of prices and decreased margins for both Crop Protection Manufacturers and Distributors will continue to the end of the continuum.

There will be less opportunistic buying and selling going into 2021, and both manufacturers, as well as Distributors, will need to work on longer lead times with less predictability in demand cycles (Frabotta, 2020b).

Concerning Backward Integration and Strategic Sourcing, we noted that in July 2020 as part of the survey, most respondents indicated that backward integration had been a focus long before the pandemic. A new paradigm exists where companies seek business relationships promoting transparency, reliability, shared risk, and ease of doing business, compared to price-based transactional relationships. The paradigm encourages the companies to collaborate, share strategic growth plans as well as operational details in the quest to share goals within an aligned culture (Frabotta, 2020b).

It was noted above that the Biological Crop Protection Segment had experienced the most significant growth compared to other product segments. The article further supports this view with the inclusion of biological fertilizers and biological stimulants in the view earlier expressed. Soil health, plant microbiome and ways to reduce abiotic and biotic stressors have received an increased research focus. It is the view of the writer of this article that, although we identified consolidation earlier as a “stop sign” in July 2020, this segment will in 2021 continue to consolidate with traditional Chemical Research-based Multi-National Crop Protection Manufactures. The most notable recent consolidation was Syngenta acquiring Valagro and AMVAC acquiring Agrinos, both these companies are focused in the bio-stimulant segment.

Consumer demand, regulatory changes, worker safety on farms and environmental stewardship continue to drive the increased aim to understand these products and to adopt them on farm level. (Frabotta, 2020b) We have noticed the phenomena in companies worldwide through Corporate Governance, and the importance of the Triple P (Profit, Planet, and People) bottom line reporting required.

The ongoing balance specified in the Crop Protection Industry has become a significant issue where consumers continue to demand more socially responsible products in a more transparent production and information availability manner.

Consumers continue, specifically new generations who enter the workforce (Generation Z), to become more engaged in how their food is produced and how these companies support social implications (Frabotta, 2020b).

We noted above that automation will accelerate into 2021, and we have identified that precision agriculture will play a significant role in the quest for food security, where growers will be able to do more with less. The continued uncertainty in the labour market will continue to drive the adoption of automation and precision agriculture into 2021. Imagery, automation, and robotics have seen advances and are finally merged into useful applications that will change application frequency and volumes concerning Crop Protection Product Application (Frabotta, 2020b).

Regulatory challenges noted in the Crop Protection Industry Challenges will continue into 2021 with the EU leading the tightened restrictions of many active crop protection ingredients. The new initiative, Farm to Fork, outlines sustainability goals in the attempt to reduce pesticide use by 50% in the year 2030, as well as flatten the curve concerning the use of mineral fertilizers by 20% (Frabotta, 2020b).

2.5.4 Business Model as a Concept

The Business Model as a concept has received abundant research attention since its inception by Osterwalder, Pigneur, and Tucci in 2005. Academics, students, and managers on different levels have emphasised the importance of the Business Model Concept as a critical tool for the success and sustainability of an organisation (Rasuli *et al.*, 2015).

It is noted that there are many definitions in the literature about the Business Model Concept. However, Osterwalder, Pigneur, and Tucci in 2005 proposed the following highly cited, comprehensive definition where they divided the concept between the business model, strategy, and process modelling:

“A business model is a conceptual tool containing a set of objects, concepts, and relationships to express the business logic of a specific firm. Therefore we must consider which concepts and relationships allow a simplified description and representation of what value is provided to customers, how this is done and with which financial consequences.” (Osterwalder et al., 2005).

Below follows the discussion of the Business Model Concept and its place in an organisation to understand the importance thereof, and to link its applicability to the study to develop segment-specific business models for Crop Protection Distributors in South Africa.

2.5.4.1 Clarifying the Business Model Concept

The debate between strategy and business models in literature sometimes refers to it as interchangeable (Magretta, 2002), while others refer to it jointly as those who offer competitive advantage (Stähler, 2002). The strategy involves competition compared to the business model focus on nine Business Blocks to create value, with a more rigorous in-depth view of what the company has to offer, compared to the strategy which has an external focus to competition aligned.

Thus, the business model focuses on giving detail to the elements and the relationship which provides the outline of how this organisation creates and markets value. The debate between the different strategy and business models include execution and implementation, and is viewed as the “domain of strategy”. In contrast, the business model is viewed as “how the business works”.

This, in particular, has drawn some concern to the implementation and execution of the business model, where a good business model can fail due to poor management and implementation skills. In contrast, the contrary (a poor business model can succeed due to good management and implementation skills) is also applicable (Osterwalder et al., 2005).

(Osterwalder et al., 2005) continues to clarify the Business Model Concept against Enterprise Modelling and Business Process Modelling, both focusing on efficiency improvement within the organisation (internal). However, it needs to be clearly understood that the Business Model Concept’s main purpose is to find and design a promising business concept (the nine building blocks of the Business Model Concept).

Osterwalder, Pigneur, and Tucci proposed the following definition for the business model supporting their literature synthesis:

“A business model is a conceptual tool that contains a set of elements and their relationships and allows expressing the business logic of a specific firm. It is a description of the value the company offers to one or several segments of customers and of the architecture of the firm and its network of partners for creating, marketing, and by delivering value and relationship capital, to generate profitable and sustainable revenue streams.”

With specific reference to the study, the highlighted keywords “value”, “one or several segments of customers”, and “generate profitable and sustainable revenue streams”, which in the opinion of the author hereof, fundamentality supports the primary research question.

The nine building blocks of the Business Model Concept are illustrated in the table below (Osterwalder *et al.*, 2005).

Table 5: Nine building blocks of the Business Model Concept

Pillar	Business Model Building Block	Description
Product	Value Proposition	Gives an overall view of a company's bundle of products and services.
Customer Interface	Target Customer	Describes the segments of customers a company wants to offer value to.
	Distribution Channel	Describes the various means of the company to get in touch with its customers.
	Relationship	Explains the kind of links a company establishes between itself and its different customer segments.
Infrastructure Management	Value Configuration	Describes the arrangement of activities and resources.
	Core Competency	Outlines the competencies necessary to execute the company's business model.
	Partner Network	Portrays the network of cooperative agreements with other companies necessary to efficiently offer and commercialize value.
Financial Aspects	Cost Structure	Sums up the monetary consequences of the means employed in the business model.
	Revenue Model	Describes the way a company makes money through a variety of revenue flows.

These nine building blocks were developed in 2009 by the well-known Business Model Canvas, which presents the above on one canvas which describes the complete vision of how the company or organisation creates, delivers, and captures value.

The literature study will now focus on the categories where the Business Model Concept contributes significantly to an organisation:

- Understanding and sharing
- Analysing
- Managing
- Prospects (Osterwalder *et al.*, 2005)

2.5.4.2 Understanding and sharing

Although a business model represents the simplification of an organisation's business concept, it is rarely described conceptually. Conceptually defining the business model helps improve the understanding amongst all role players in a clear manner.

The visual representation of a business model not only improves understanding but also helps to improve the communication and sharing of the business logic (Osterwalder *et al.*, 2005).

2.5.4.3 Analysing

The Business Model Concept can significantly contribute by assisting in analysing the business logic of an organisation. With specific reference to the measurement of the efficiency to improve management, track and observe to address internal and external challenges and changes which continuously evolve, and to compare over time how effective your own organisation's business model performs against the business models implemented by your competitors (Osterwalder *et al.*, 2005).

2.5.4.4 Managing

The success of a business model relies inherently on the interaction amongst various elements within an organisation, structured to optimise the value to be created. The Business Model Concept assists in the improvement of management to react to changes in the business environment and to align strategies, their organisation and adopt technology timeously. The visualisation of the business model clearly illustrates the interaction of the elements. When changes should occur, they inevitably assist in the identification of how these elements would be required to be adapted.

Chesbrough and Rosenbloom (2000) have identified that business models act as a mediator between technology and economic value, to develop and improve current methods of doing business.

The Business Model Concept, as explained above, not only improves understanding amongst all role players, but also enables decision-makers to be more informed, help define measures, and improve their ability to make decisions to the benefit of the organisation's profitability and sustainability (Osterwalder *et al.*, 2005).

2.5.4.5 Prospect

We discussed the concept of continuous improvement and increased timeous reaction capacity within an organisation. Osterwalder *et al.* (2005) continue to explain that the Business Model Concept (formal and modular approach) will improve and foster innovation.

They continue to explain that the building blocks can be used as a box of Lego Blocks (Burgi & Victor, 2004) were the architects using the business model "lego blocks" can build completely new business models to create competitive advantage.

Allen's Law of Excess of Diversity in Evolutionary Theory (Allen, 2001) has the idea that a sustainable and successful evolutionary strategy is only created in an environment where an amount of internal diversity, superior to that of their environment, exists.

Allen continues to argue that the agents involved in the diverse superior strategy would have required stock of potential strategies which can be evaluated in unprecedented or unpredictable environmental changes, and then implemented as and when needed. Osterwalder *et al.* (2005) apply this to the Business Model Concept to indicate that an organisation should hence follow Allen's law and have a stockpile of Business Models ready to be implemented in the future to address sustainability.

This stockpile of Business Models can be simulated and tested with little endangerment of the organisation (in a low-risk environment), which will enable organisations and managers to improve their preparation for the uncertainty of the future and the business environment.

2.5.5 Current Business Models in Crop Protection Distribution in South Africa

The Crop Protection Distributors' business model focused on the appointment of affiliated commission-based agents in various localities/towns. Here the agent acts as an independent contractor and enters into an exclusive or semi-exclusive distribution agreement with the Distributor, to promote, sell and distribute the products from the Distributor, who in return has established agreements with manufacturers. It is noteworthy that this specific business model, since its establishment in the early 1990s, has remained the primary model for the end-user (producer/farmer).

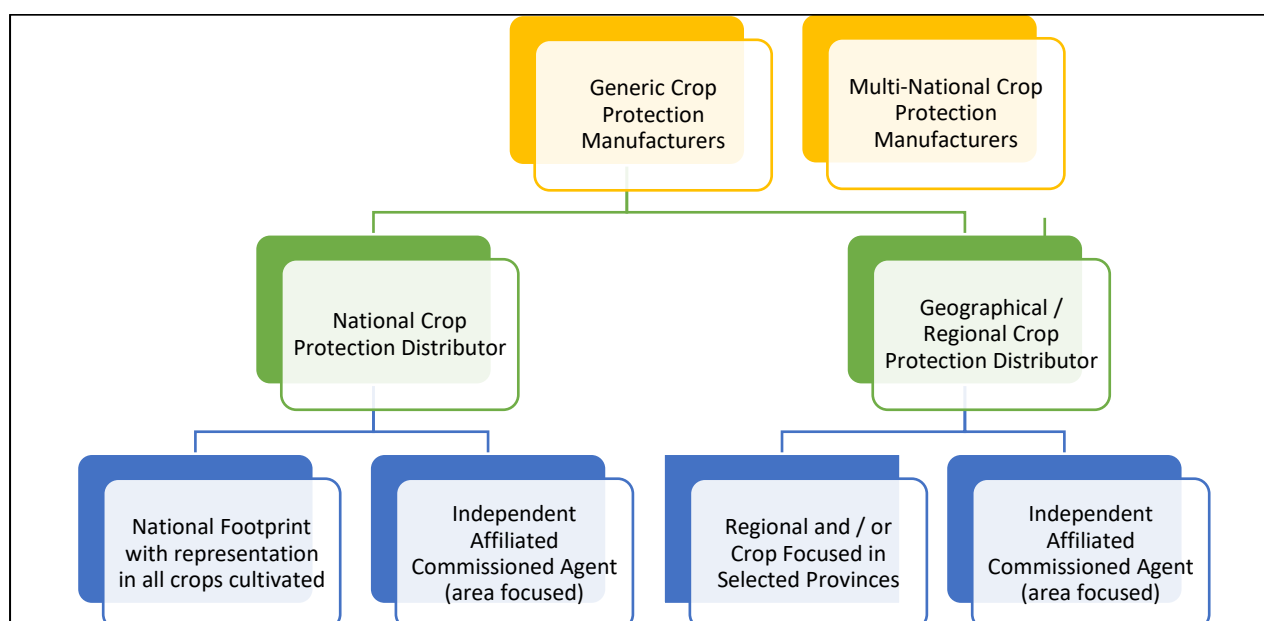
It has been noted in the literature above that not much has changed in agriculture for the past 30 years. The same applies to South Africa, and more particularly, the business model used for Crop Protection Distribution. F.A Schreuder noted in his research that in 2002 South African manufacturers of Crop Protection Products used 46 independent distributors through the assistance of 600 affiliated commission agents (Schreuder, 2002).

Currently, as per the CropLife SA website, there are 32 independent distributors and 986 affiliated commission agents. We have thus seen a slight consolidation in independent distributors. However, the number of affiliated commission agents has grown by 64% (Croplife South Africa, 2019).

In contrast to the growth in affiliated commission agents, the number of commercial producers in South Africa has continued to decline from 60 000 in 1996, to 45 000 in 2002, and to less than 40 000 in 2009 (Hall, 2011). It is expected that this number decline further to approximately 15 000 by the year 2027.

The business model in the Crop Protection Industry can be visualised and illustrated in the figure below.

Figure 3: Business model of Crop Protection Industry in South Africa



2.5.5.1 The Crop Protection Distributor

The roles and responsibility of the Crop Protection Distributors are mainly to conclude (first and foremost with Multi-National Crop Protection Manufacturers) a distribution agreement to access their products. The second focus will be to support the Multi-National Crop Protection Portfolio with a Generic Crop Protection Portfolio, to complement and complete the Crop Protection Product Portfolio available to growers.

The more options and research-based focused a Crop Protection Distributor product portfolio is, the more attractive they become to Independent Affiliated Commissioned Agents to join the Crop Protection Distributor.

Most Crop Protection Distributors focused solely on the Crop Protection portfolio with little to no diversification in the product portfolio concerning Fertilizers, Specialised Fertilizers, Bio Inoculants, Bio Pesticides, and Bio-Stimulants (with specific reference to some Regional and National Crop Protection Distributors). Instead of focusing on the various product segments to ensure diversification, some Crop Protection Distributors divested their control to multiple manufacturers for support.

Those Crop Protection Distributors who aimed to innovate and differentiate the product portfolio, supporting the phenomena of increased Biological focus seen worldwide, has seen more success compared to those following a traditional Crop Protection Product Portfolio with the divestment of other product segments to suppliers.

The divestment of other product segments to suppliers might create disjuncture amongst Crop Protection Distributors and the suppliers to the extent of shared vision, goals, company objectives and serving interest phenomena, compared to growers/customer-centricity.

In the figure above, we noted Regional and National Crop Protection Distributors, the main differences exist in geographical operational activities. This model was first and foremost created by Multi-National Crop Protection Manufacturers who divested their power of distribution into Regional Crop Protection Distributors in the early 1990s, except for Wenkem, who at that stage was the only National Crop Protection Distributor. Since the early 1990s, three additional Crop Protection Distributors joined Wenkem as National Crop Protection Distributors namely, AECI Plant Health, InteliGro, and Laeveld Agrochem.

Crop Protection Distributors' responsibilities include procurement and financing of working capital, appropriate training, technical support, administration support, logistical efficiency, regulatory compliance, product portfolio management and availability, as well as strategic direction and innovation.

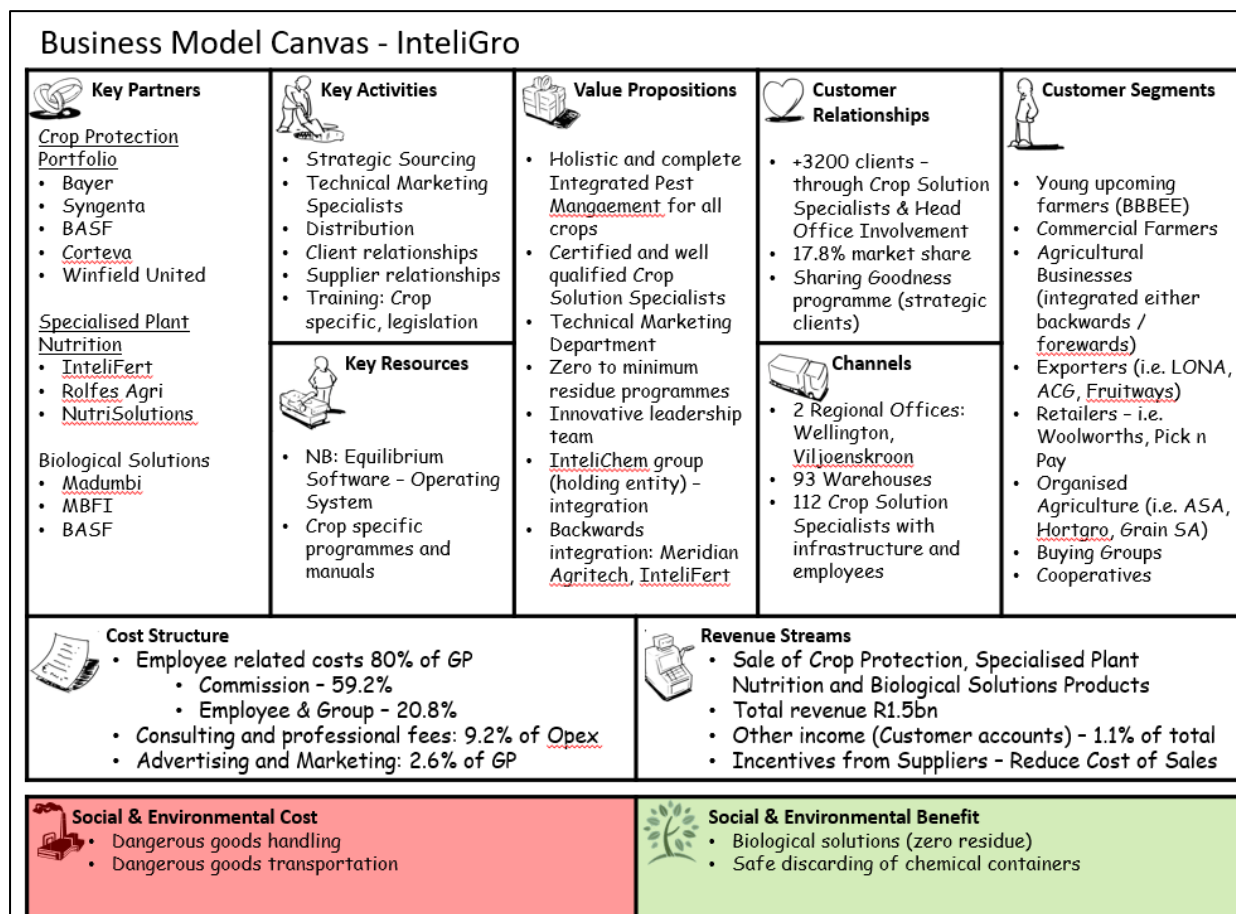
Crop Protection Distributors appoint Independent Affiliated Commissioned Agents on a profit-sharing base. The majority of the profit share (80/20, 70/30 split) resonates in the form of commission towards the Independent Affiliated Commissioned Agents. This model continues to be the business model adopted in the earlier 1990s regarding revenue or profit distribution. Crop Protection Manufacturers, before the divestment of their product distribution to selected Regional Crop Protection Distributors, used to appoint their own "salary-based" representatives.

The model of salary-based representatives was aimed to be implemented by various Crop Protection Distributors since the 1990s, with minimal success in the past decade due to the ease of entry into the market and move to other Crop Protection Distributors. Entry into market share was the aim of each of the various Crop Protection Distributors, to improve scalability in product negotiations (to decrease prices), increase mass and attempt to increase profit margins.

This model has, unfortunately, as noted in the literature above, not been successful worldwide and those competing in this section will continue to be seen as “swimming in the red-ocean”.

The current business model of IntelliGro is illustrated in the Business Model Canvas below (Osterwalder *et al.*, 2005):

Figure 4: Business Model Canvas: IntelliGro



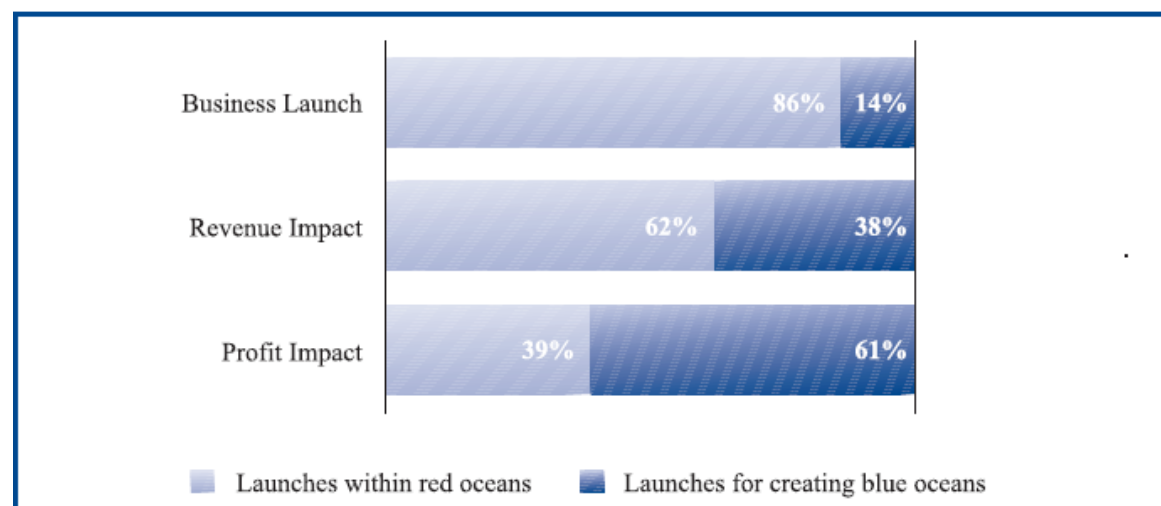
The business model above will be assessed for the study against the analysis of the results of each of the grower segments. This is done to determine its feasibility and if changes will be required to be made to this business model to address the needs and wants of the growers in the various segments, or whether this business model predominantly resonates within a specific segment (Research Proposition 3).

2.5.6 Value Innovation: the link towards a Blue Ocean Strategy

Value innovation has been defined by Chan Kim and Mauborgne in 1997 as companies who do not focus on beating or matching their rivals, but instead aim at employing a strategic logic to make their competitors irrelevant (Chan *et al.*, 1997). These companies focused on getting out of the existing market boundaries (Red Ocean) through the creation of significant value for their customers, which kept them ahead of their competitors (Chan *et al.*, 2005a).

In the latter research done by Chan *et al.* (2005) where they follow-up their journal article in the quest to link value innovation to the blue-ocean strategy, they argue that “Value Innovation is the cornerstone of the blue-ocean strategy”. The phenomena of both value innovation and Blue Ocean Strategy exists where value innovation Companies launched the business in the event to create blue ocean strategies, which accounted for 14% of the total new business launches. Out of these 14% new launches, they generated 38% of the total revenues across the study and a phenomenal 61% of the total profits. Thus, the secret lies not in the value of revenue generation, but profit generation (see Figure 1.5 below).

Figure 5: *The profit and growth consequences of the Blue Ocean strategy*
(Chan *et al.*, 2005a)



It is noted that the conventional strategic logic and the logic applied to value innovations have five dimensions of strategy, which differ significantly. They are (1) Industry Assumptions, (2) Strategic Focus, (3) Customers, (4) Assets and Capabilities, and (5) Product and Service Offerings (see Table 1.5 below).

Table 6: Five dimensions of strategy

Two Strategic Logics		
The Five Dimensions of Strategy	Conventional Logic	Value Innovation Logic
Industry Assumptions	Industry's conditions are given.	Industry's conditions can be shaped.
Strategic Focus	A company should build competitive advantages. The aim is to beat the competition.	Competition is not the benchmark. A company should pursue a quantum leap in value to dominate the market.
Customers	A company should retain and expand its customer base through further segmentation and customization. It should focus on the differences in what customers value.	A value innovator targets the mass of buyers and willingly lets some existing customers go. It focuses on the key commonalities in what customers value.
Assets and Capabilities	A company should leverage its existing assets and capabilities.	A company must not be constrained by what it already has. It must ask, What would we do if we were starting anew?
Product and Service Offerings	An industry's traditional boundaries determine the products and services a company offers. The goal is to maximize the value of those offerings.	A value innovator thinks in terms of the total solution customers seek, even if that takes the company beyond its industry's traditional offerings.

Chan Kim and Mauborgne modified the above Two Strategic Logics framework to develop the Six Path Framework. This enables companies to identify possibilities that exist and to reconstruct market boundaries focusing on the Blue Ocean Strategy (Chan et al., 2005b).

Table 7: Six path framework

	Head-to-Head Competition	Blue Ocean Creation
Industry	Focuses on rivals within its industry	Looks across alternative industries
Strategic Group	Focuses on competitive position within strategic group	Looks across strategic groups within industry
Buyer Group	Focuses on better serving the buyer group	Redefines the industry buyer group
Scope of Product or Service Offering	Focuses on maximizing the value of product and service offerings within the bounds of its industry	Looks across to complementary product and service offerings
Functional-emotional Orientation	Focuses on improving the price performance within the functional-emotional orientation of its industry	Rethinks the functional-emotional orientation of its industry
Time	Focuses on adapting to external trends as they occur	Participates in shaping external trends over time

To obtain a competitive advantage, those following a Blue Ocean Strategy will enable the company to create uncontested market space, make the competition irrelevant, create and capture new demand, break the value-cost trade-off, and align the complete system of the company's activities in the pursuit of differentiation and low-cost (such as the best-cost provider strategy).

The table below provides a brief illustration of the difference between the Red Ocean and Blue Ocean Strategy (Kim *et al.*, 2005).

Table 8: Red-Ocean vs Blue Ocean Strategy

Red Ocean Strategy	VS	Blue Ocean Strategy
Compete in existing market space.		Create uncontested market space.
Beat the competition.		Make the competition irrelevant .
Exploit existing demand.		Create and capture new demand.
Make the value-cost trade-off.		Break the value-cost trade-off.
Align the whole system of a firm's activities with its strategic choice of differentiation or low cost .		Align the whole system of a firm's activities in pursuit of differentiation and low cost .

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It was noted in the Introduction of Chapter 1 that the profitability of the Crop Protection Distributors in South Africa is under strain. With the continued decline in the profits of 2% to 3%, one can argue that most Crop Protection Distributors swim in a red-ocean where competition is fierce, bloody and products and services offered are commoditised. The study will aim to advise IntelliGro on how to develop a blue-ocean strategy following the Six Path Framework, as well as develop a "Value Curve" which is designed to be able to show the organisation instantly where **value** is created from the IntelliGro product and services in each of the segments. The "Value Curve" will then graphically illustrate the way IntelliGro or the Crop Protection Industry configures its growers' offering.

A blue-ocean strategy alone will not suffice, as any organisation is required to be able to swim in the red-ocean successfully while balancing their blue-ocean strategy (Chan *et al.*, 2005a). It will thus be imperative that Crop Protection Distributors understand that in a world where new active ingredients and molecules as super-star products are being marketed has been slow and far in-between. This is mainly due to the regulatory environment and the excessive cost to develop one new active ingredient, which exceeds \$350 million and takes 11 years from the identification of the new molecule until the stage where it can be marketed.

There will be significant commodity and post-patent crop protection products, and Crop Protection Distributors will need to adapt their service offering to create value, to follow a low-cost provider strategy in a red-ocean while following a best-cost provider strategy in the blue ocean.

It is only through increased market share that red-ocean strategies and reduction in logistics and handling of the product that Crop Protection Distributors will increase profitability should they not follow a Blue Ocean strategy.

Any company must remember that once they have created a blue ocean, they should aim to prolong its profit and growth strategy. They should make themselves a target which continually moves as they keep strategizing and keep within the blue ocean of differentiation and value creation, to try and distance themselves from potential imitators and through these actions discourage them, thus outlasting and out-leaping them. (Chan *et al.*, 2005a)

2.6 SUMMARY

This chapter provides an overview of the most notable challenges facing agriculture and the Crop Protection Industry. The chapter continues to focus on the specific challenges for Crop Protection Distributors and linking those challenges to the South African domain. In the Crop Protection Distribution Industry, the focus was placed on the paradigm of trust in the channel, explaining the role of the Crop Protection Distributors where a high level of trust and knowledge still resonates amongst growers.

The chapter explains the current state of vulnerability of the Crop Protection Distributors which threaten their existence and sustainability. This is due to continued profit erosion based on numerous increased cost-based factors, but most notably, the change in demographics of the growers and their needs. We also discuss the impact of COVID-19 on the Crop Protection Industry and continue to look forward to possible trends following the pandemic.

The chapter moves towards the Business Model Concept (Osterwalder *et al.*, 2005), explaining the importance of the concept for the sustainability of organisations and strategic supremacy with the link to value innovation. The current business models for Crop Protection Distributors in South Africa are explained in detail since its inception in the 1990s and specifically included the InteliGro Business Model Canvas.

The business model will be assessed against the analysis of the results of each of the grower segments to determine its feasibility and whether changes will be required to be made to this business model, to address the needs and wants of the growers in the various segments, or whether this business model predominantly resonates within a specific segment (Research Proposition 3).

We conclude the chapter by explaining the importance of value innovation as created by (Chan *et al.*, 1997) and how this concept was refined into the Blue Ocean Strategy (Chan Kim & Mauborgne, 2005a). We conclude that a blue-ocean strategy on its own will not suffice and organisations should balance the ability to swim in both the red-ocean successfully as well as balancing their blue-ocean strategy.

Any company must remember that once they have created a blue ocean, they should aim to prolong its profit and growth strategy. They should further make themselves a target which continually moves as they keep strategizing and keep within the blue ocean of differentiation and value creation, to try and distance themselves from potential imitators and through these actions discourage them, thus outlasting and out-leaping them.(Chan Kim & Mauborgne, 2005a)

CHAPTER 3: RESEARCH ANALYSIS AND RESULTS

3.1 RESEARCH ANALYSIS

The representation of the target population by the probability sample is the most important aspect. A perfect representative sample is one that represents the target population exactly. The probability sample is summarised below.

Table 9: Actual sample size

	Corporate Agri-Business	Mega-Sized Commercial Growers	Medium and Large Sized Commercial Growers	Total
<i>Sample</i>	55	113	250	418
<i>Sampling Frame</i>	55	113	529	697
<i>Sampling %</i>	100%	100%	47% - systematic random	

We conclude that the probability sample is perfect as it represented 100% of each of the Corporate Agri-Business - and Mega-Sized Commercial Growers segments, and through a systematic random sampling method, represent 47% of the Medium and Large Sized Commercial Growers segment. The total of the probability sample amongst all three segments represents 60% of the target population.

It is understood that a high response rate should be obtained to reduce the risk of non-response bias. The total number of surveys collected amounted to 107 responses through which data was collected, and a total of 147 completed the survey. Amongst the 147 who completed the survey, there were 40 non-responses (complete refusals). These non-responses are seen as different from the target population because they refused to take part in the study (Saunders *et al.*, 2016).

The research analysis will be conducted on the 107 responses received, which constitutes the following response rate (less ineligible) per segment:

Table 10: Actual response rate

	Corporate Agri-Business	Mega-Sized Commercial Growers	Medium and Large Sized Commercial Growers	Total
<i>Sample</i>	55	113	250	418
<i>Ineligible</i>				-40
<i>Total sample</i>				378
<i>Responses</i>	12	47	48	107
<i>Response rate</i>	22%	42%	19%	28%

Once the questionnaires have been completed, the data will be exported from SurveyMonkey to an Excel format. This document will then be sent to the North-West University Department of Statistical Consultation Services to analyse the data obtained. The analysis, once completed, was sent to the researcher to interpret the results as part of the study.

Analysis structure as returned from the North-West University Department of Statistical Consultation Services:

Section 1:	Question 3 – 13:	Frequency analysis
Section 2:	Question 14 – 21:	Standard deviation, means analysis
Section 3:	Question 22 – 23:	Frequency and standard deviation, means analysis
Section 4:	Question 24 – 25:	Standard deviation, means analysis
Section 5:	Question 26:	Frequency analysis
Section 6:	Question 27 – 28:	Frequency analysis

3.2 RESULTS AND DISCUSSION OF RESULTS

The results from the surveys were segmented based on the following criteria:

- 1) Integration into the value chain
- 2) Legalised structure
- 3) The total value of Crop Protection Product procured on an annual basis

The following three segments were identified from the results:

Corporate Agricultural Businesses

Mega Commercial Farmers

Medium and Large Commercial Farmers

The study thus focuses on these three segments, and the results are explored following the questions answered to determine what will be the preferred business model specifically required for each of these segments.

Figure 6: Corporate agri-businesses segmentation profile

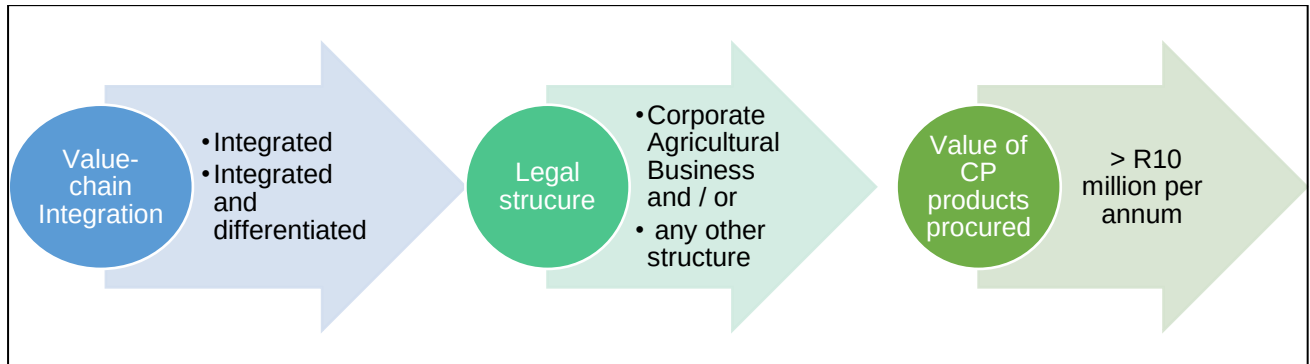


Figure 7: Mega-Sized Commercial Growers segmentation profile

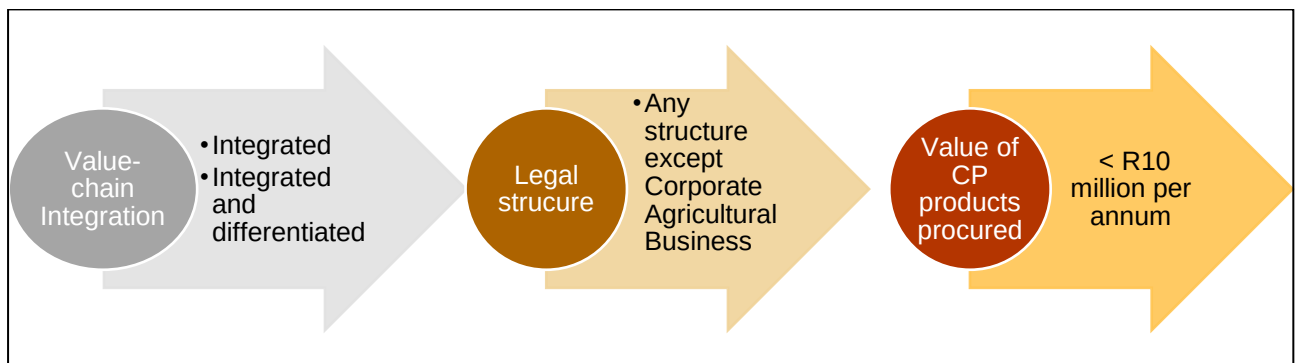
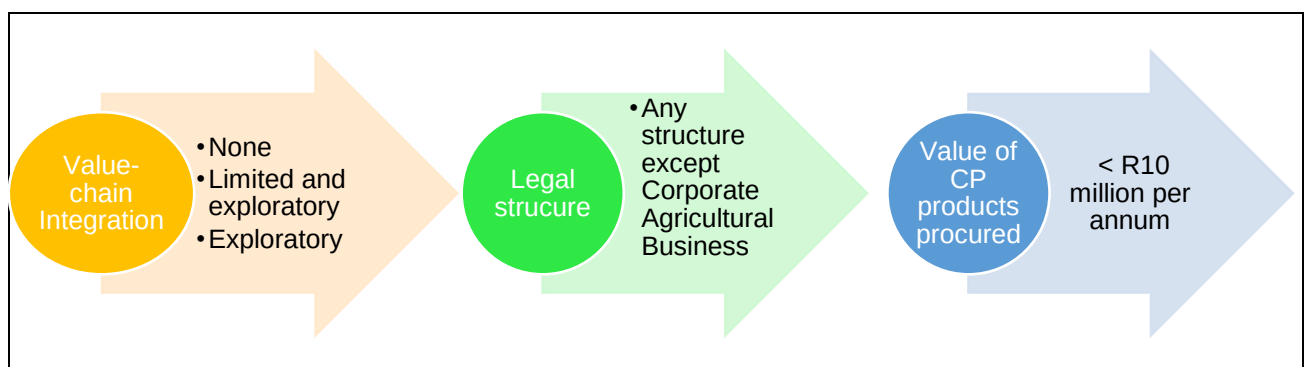


Figure 8: Medium and large-sized commercial farmers segmentation profile



Following the above criteria, the responses (107) and data were segmented, providing the following results:

- Corporate Agricultural Businesses: 12 questionnaires completed
- Mega Commercial Farmers: 47 questionnaires completed
- Medium and Large Commercial Farmers: 48 questionnaires completed

The questionnaire format is discussed per segment below.

Table 11: Questionnaire format

Section	Questions	Description and purposes
Section 1	Q3 - Q13	Determine the description, positional decision-makers, legalised structure, ownership structure, demographics, Crop cultivation, financing activities, Crop Protection, Channel Procurement, Channel preference, scale, and profile of the segment.
Section 2	Q14 - Q21	Procurement patterns and which factors influence the decision-makers in their choice of procuring Crop Protection based on the needs/requirements of the segment.
Section 3	Q22 - Q23	To determine to what extent the respondents will consider an e-commerce model per segment and what will be their primary objective in following this business model/channel.
Section 4	Q24 - Q25	Segment-specific importance to access latest technology and information.
Section 5	Q26	Frequency measure of service level from Crop Protection Distributors by specific role players.
Section 6	Q27 - Q28	Which segment provides the biggest appetite to integrate backwards with their Crop Protection Distributors, and what will be their primary objective to integrate backwards.

Section 1: Profile of each Grower Segment

Question 3 – 13: Determine the description, positional decision-makers, legalised structure, ownership structure, demographics, Crop cultivation, financing activities, Crop Protection Channel Procurement, Channel preference, scale, and profile of the segment.

A: Corporate Agricultural Businesses

The results for the Corporate Agri-Business profile and segment indicate that majority decision-making authority lies within managerial positions.

Table 12: Which position do you hold in the company?

	Frequency	Per cent
Farm Manager	1	8.3
General Manager	3	25.0
Input / Procurement Manager	1	8.3
Managing Director	3	25.0
Production Manager	2	16.7
Technical Manager / Director	2	16.7
Total	12	100

The data below represents those required for segmentation purposes, where 83% of the respondents' legalised structure constitutes Private Companies and 17% Corporate Agricultural Businesses.

Table 13: Legal structure

	Frequency	Per cent
Corporate Agricultural Business	2	17.0
Private company (i.e. (Pty) Ltd)	10	83.0
Total	12	100.0

The shareholding structure of the Corporate Agri-Businesses segment presented in Table 14 to 16 indicates that this segment has a majority (67% own shareholding). Where external shareholding exists, there is a significant investment into these entities. External investments from foreign entities and BBBEE compliance in this segment is still limited and exploratory.

Table 14: Shareholding structure

	Frequency	Per cent
100% own shareholding	8	67.0
External Shareholding	4	33.0
Total	12	100.0

Table 15: External shareholding %

	Frequency	Per cent
>50.1%	2	50.0
25.1% - 50%	2	50.0
Total	4	100.0

Table 16: Foreign entity shareholding %

	Frequency	Per cent
0.1% - 25.0%	1	8.3
>50.1%	1	8.3
N/A	10	83.4
Total	12	100.0

Table 17: BBBEE shareholding %

	Frequency	Per cent
25.1% - 50%	1	8.3
N/A	11	93.7
Total	12	100.0

Table 18 below represents to which extent the Corporate Agri-Businesses cultivate their crops only in their geographical area or have a National Footprint (that is, operating in more than one province). The data below indicates that only three (3) producers in this segment cultivate their crops in more than one province (25% of total respondents), and nine (9) producers indicate that they cultivate their crops predominantly in one province (different geographical areas within the province).

Table 18: Provinces they cultivate their crops

	Frequency	Per cent
Gauteng	1	6.3
Kwazulu-Natal	1	6.3
Limpopo	4	25.0
Mpumalanga	1	6.3
Eastern Cape	3	18.8
Western Cape	5	31.3
Namibia	1	6.3
Total	16	100

Table 19 represents the crops cultivated, the total hectares per crop and established to which extent the Corporate Agri-Businesses are diversified in their crops cultivated. It was interesting to note that all the respondents in this segment cultivate irrigated, higher marketing value crops, compared to lower value dry land Summer Row Crops, Oilseeds and Winter Cereals.

The results below also indicate that nine (9) producers in this segment cultivated crops which are focused on the export market and three (3) on the local market. The table below reported results where eight (8) producers cultivated multiple crops (diversified orientation) and four (4) producers only focused on single crops. It can be summarised that this segment focuses on diversification (67% of respondents) and all these respondents in the segment cultivate high-value crops.

Table 19: Crops cultivated and hectares

	Potatoes - Ha Irrigated	Vegetables (Cruciferae, cucurbits, carrots) - Ha Irrigated	Pome Fruit (Apples, Pears) - Ha Irrigated	Minor crops (Blueberries) - Ha Irrigated	Tree Nuts (Pistachios, Macadamias, Pecan) - Ha Irrigated	Citrus - Ha Irrigated
Hectares	Frequency	Frequency	Frequency	Frequency	Frequency	Frequency
0-499 hectares		2	2	2	2	2
500 - 999 hectares	2	1				3
1000 - 1999 hectares						
2000 - 2999 hectares						1
3000 - 3999 hectares			1			
Total	2	3	3	2	2	6

	Citrus - Ha Irrigated	Summer Row Crops (Maize, Sorghum, Dry Beans) - Ha Irrigated	Stone Fruit (Peaches, Plums) - Ha Irrigated	Sub-tropical (Avo's, litchis, mango's) - Ha Irrigated	Tomatoes (Table and Processed) - Ha Irrigated	Table Grapes - Ha Irrigated
Hectares	Frequency	Frequency	Frequency	Frequency	Frequency	Frequency
0-499 hectares	2	1	2	2		
500 - 999 hectares	3					1
1000 - 1999 hectares			1	1	1	
2000 - 2999 hectares	1					
3000 - 3999 hectares						
Total	6	1	3	3	1	1

	Wine Grapes - Ha Irrigated	Winter Cereals (Wheat, Barley, Oats) - Ha Irrigated	Onions - Ha Irrigated	
Hectares	Frequency	Frequency	Frequency	Total
0-499 hectares	1	1	2	19
500 - 999 hectares			1	8
1000 - 1999 hectares				3
2000 - 2999 hectares				1
3000 - 3999 hectares				1
Total	1	1	3	32

Table 20 focuses on how Corporate Agri-Businesses finance their Crop Protection Inputs. The results below indicated that this segment can be viewed as cash-rich and they finance their Crop Protection Inputs majority (80%) through the use of their funds while 20% is financed through financial institutions.

Table 20: How do you finance your agricultural Crop Protection Inputs?

Type of Financing	Frequency	Per cent
Financial Institution / Commercial Banks (for example. Landbank, Standard Bank, Absa, FNB)	2	20.0
Own funding	8	80.0
Total	10	100.0

Table 21 represents the results where Corporate Agri-Businesses procure their Crop Protection Products. This question aimed to establish whether this segment only focuses on one Crop Protection Supplier or multiple Suppliers. The results below can be summarised as follows: Corporate Agri-Businesses mainly procure from National Crop Protection Suppliers (82.1%), and they chose various Suppliers (10 of the 12 respondents

procured from more than one channel), which indicates that this segment is highly business - and reputable Crop Protection Supplier orientated.

Table 21: From which Agricultural Crop Protection Supplier do you procure your crop protection products?

	Frequency	Per cent	Cumulative Percentage
InteliGro	9	32.1	32.1
LAC (Laeveld Agrochem)	3	10.7	42.8
Nulandis	7	25.0	67.8
Wenkem	4	14.3	82.1
Other	5	17.9	100.0
Total	28	100.0	

Question 12 was designed to determine which channel they predominantly follow when procuring their Crop Protection Inputs, considering the traditional business model (sale via Crop Advisor) compared to other variable options and business models which existed in the market. The results in Table 22 below indicated that Corporate Agri-Businesses focus on transacting with Crop Advisors and Crop Protection Suppliers, and the segment focuses less on direct procurement from Crop Protection Manufacturers (BASF, Bayer, UPL, Villa Crop Protection) or Corporate Agri-Business (for example, VKB, Senwes).

The respondents indicated that they prefer the channel through Crop Protection Suppliers (60%) compared to the traditional model (sale via Crop Advisor – 26.7%). We view that Corporate Agri-Businesses are highly business orientated and negotiations and procurement would follow a direct involvement from Crop Protection Supplier Head Office Staff.

Table 22: From whom do you procure your agricultural crop protection products?

	Frequency	Per cent
Crop Advisor (previously known as Agent)	4	26.7
Crop Protection Supplier (i.e. Nulandis, LAC, Wenkem, InteliGro)	9	60.0
Crop Protection Manufacturer (i.e. BASF, Bayer, Corteva, Villa Crop Protection, UPL)	1	6.7
Corporate Agricultural Business (i.e. Afgri, Kaap Agri, Senwes, VKB)	1	6.7
E-commerce	0	0.0
Total	15	100.0

Table 22 represents results which indicate what products are procured through the channels described in Table 22, which show a fair distribution amongst what a Crop Protection Supplier should offer to producers in this segment. Majority respondents in Corporate Agri-Business focused on Crop Protection Products and Specialised Plant Nutrition (80%) and less on Granular Fertilizers. Crop Protection Suppliers should focus their product positioning and offer to these segments.

Table 23: Which products do you procure from the channels selected above?

	Frequency	Per cent
Crop Protection Products (i.e. herbicides, insecticides, fungicides, nematocides)	8	32.0
Specialised Plant Nutrition (i.e. foliar feeds, bio-stimulants, fertigation)	6	24.0
Crop Protection and Specialised Plant Nutrition	6	24.0
Granular fertilizers	5	20.0
Total	25	100.0

Table 23 aims to understand what procurement policy exists in the various segments. The results below indicated that Corporate Agri-Businesses follow own purchase decision-making procurement policy, with no focus towards joining buying groups and little focus towards following a tender policy. It would be considered that Corporate Agri-Businesses are large scale, and due to their scale, they believe that their negotiations would be prudent to procure to their best benefit.

Table 24: Which of the following statements best reflect your purchasing of Crop Protection Inputs?

	Frequency	Per cent
Own purchase decision	12	85.7
Buying group	0	0.0
Tender	2	14.3
Total	14	100.0

B: Mega-Sized Commercial Growers

The results for the Mega-Sized Commercial Growers' profile and segment indicate that majority decision-making authority lies within managerial positions and owners (53.2%). The owners in this segment play a significant role in the day-to-day operations and decision-making.

Table 25: Position you hold in the company or farm

	Frequency	Per cent
Farm Manager	8	17.0
General Manager	4	8.5
Input - / Procurement Manager	1	2.1
Managing Director	14	29.8
Owner	11	23.4
Production Manager	4	8.5
Technical Manager / Director	5	10.6
Total	47	100.0

Table 26 represents that various legal structures exist in this segment, with majority Private Companies supporting the results in Table 25 above, that decision-making authority lies within a management and owner structure.

Table 26: Legal Structure

	Frequency	Per cent
Close Corporation	9	19.1
Individual	6	12.8
Partnership	2	4.3
Private company (i.e. (Pty) Ltd)	28	59.6
Trust	2	4.3
Total	47	100.0

The shareholding structure of the Mega-Sized Commercial Growers segment presented in Table 27 to Table 30 indicates that this segment has a majority (72.3% own shareholding). Where external shareholding exists, the shareholding % varies. External investments from foreign entities and BBBEE compliance in this segment is limited and exploratory.

Table 27: Shareholding structure

	Frequency	Per cent
100% own shareholding	38	72.3
External Shareholding	9	19.1
Total	47	100.0

Table 28: External shareholding %

	Frequency	Per cent
>50.1%	5	2.1
0.1 - 25%	2	2.1
25.1% - 50%	2	2.1
Total	47	100.0

Table 29: Foreign entity ownership

	Frequency	Per cent
0.1 - 25%	1	2.1
> 50%	3	6.4
N/A	43	91.5
Total	47	100.0

Table 30: BBBEE shareholding %

	Frequency	Per cent
0.1 - 25%	1	2.1
> 50%	2	4.3
N/A	43	93.6
Total	47	100.0

Table 31 below represents to which extent the Mega-Sized Commercial Growers cultivate their crops only in their geographical area or has a National Footprint (i.e. operating in more than one province). The data below indicates that four (4) producers in this segment cultivate their crops in more than one province (8.5% of total respondents). In contrast, the majority of the growers indicate that they cultivate their crops predominantly in one province (different geographical areas within the province).

Table 31: Provinces they cultivate their crops

	Frequency	Per cent
Kwazulu-Natal	1	2.0
Limpopo	3	5.9
Mpumalanga	4	7.8
North West	5	9.8
Northern Cape	4	7.8
Eastern Cape	4	7.8
Free State	9	17.6
Western Cape	21	41.2
Total	51	100.0

Table 32 represents the crops cultivated, the total hectares per crop, and established to which extent the Mega-Sized Commercial Growers are diversified in their crops cultivated. The table below reported results where twenty-seven (27) producers cultivated multiple crops (diversified orientation) while twenty (20) producers only focused on single crops. It can be summarised that this segment is operating on a large scale, focuses on diversification (57% of respondents) and is exploring diversification.

Table 32: Crops cultivated and hectares (Irrigated / Dryland)

	Potatoes - Ha Irrigated	Potatoes - Ha Dry Land	Vegetables (Cruciferae, cucurbits, carrots) - Ha Irrigated	Pome Fruit (Apples, Pears) - Ha Irrigated	Minor crops (Blueberries) - Ha Irrigated	Tree Nuts (Pistachios, Macadamias, Pecan) - Ha Irrigated
	Frequency	Frequency	Frequency	Frequency	Frequency	Frequency
0-499 hectares	6	1	7	7	2	5
500 - 999 hectares	2					
1000 - 1999 hectares				1		
Total	8	1	7	8	2	5

	Oilseeds (Canola, Sunflower, Soya Beans) - Ha Irrigated	Oilseeds (Canola, Sunflower, Soya Beans) - Ha Dry Land	Citrus - Ha Irrigated	Summer Row Crops (Maize, Sorghum, Dry Beans) - Ha Irrigated	Summer Row Crops (Maize, Sorghum, Dry Beans) - Ha Dry Land	Stone Fruit (Peaches, Plums) - Ha Irrigated
Hectares	Frequency	Frequency	Frequency	Frequency	Frequency	Frequency
0-499 hectares	5	3	5	13		4
500 - 999 hectares	1	3	1		1	
1000 - 1999 hectares	1	2	2	2	3	
2000 - 2999 hectares				1	1	
3000 - 3999 hectares				1	2	
more than 5000 hectares						1
Total	7	8	8	17	7	5

	Sub-tropical (Avo's, litchis, mango's) - Ha Irrigated	Tomatoes (Table and Processed) - Ha Irrigated	Table Grapes - Ha Irrigated	Wine Grapes - Ha Irrigated	Wine Grapes - Ha Dry Land	Winter Cereals (Wheat, Barley, Oats) - Ha Irrigated
Hectares	Frequency	Frequency	Frequency	Frequency	Frequency	Frequency
0-499 hectares	1	1	5	6	1	8
500 - 999 hectares		1				2
1000 - 1999 hectares						2
Total	1	2	5	6	1	12

Table 32: Crops cultivated and hectares (Irrigated / Dryland) (Continued)

	Winter Cereals (Wheat, Barley, Oats) - Ha Dry Land	Onions - Ha Irrigated	Total
Hectares	Frequency	Frequency	Frequency
0-499 hectares	1	3	84
500 - 999 hectares	2		13
1000 - 1999 hectares	2		15
2000 - 2999 hectares			2
3000 - 3999 hectares			3
4000 - 4999 hectares	1		1
more than 5000 hectares			1
Total	6	3	119

Table 33 focuses on how Mega-Sized Commercial Growers finance their Crop Protection Inputs. The results below indicated that this segment can be viewed as a combined utilisation of own resources and financing through financial institutions and Corporate Agri-Businesses, with a lesser focus on the latter financial option. They are not as cash-rich as the Corporate Agri-Businesses sector.

Table 33: How do you finance the purchases of your crop protection products?

Type of Financing	Frequency	Per centage
Financial Institution / Commercial Banks (for eg. Landbank, Standard Bank, Absa, FNB)	15	31.9
Own Funding	23	48.9
Corporate Agricultural Business / Company (for eg. Afgri, BKB, Eastern Cape Co-Op, OVK, VKB, Senwes)	9	19.1
Total	47	100.0

Table 34 represents the results where Mega-Sized Commercial Growers procure their Crop Protection Products. This question aimed to establish whether this segment only focuses on one Crop Protection Supplier or multiple Suppliers.

The results below can be summarised as follows: This segment mainly procures from National Crop Protection Suppliers (88.6%), and they chose various suppliers (25 of the 47 respondents procured from more than one channel), which can be viewed that this segment is highly business - and reputable Crop Protection Supplier orientated.

This segment's results align with the Corporate Agri-Business segment, however lower levels of various channel procurement is noted (53% vs 83%) in this segment, which indicates that they tend to rely more on one channel procurement than shopping around.

Business orientation is presented at lower levels compared to the Corporate Agri-Business segment.

Table 34: From which Agricultural Crop Protection Supplier do you procure your crop protection products?

	Frequency	Per cent	Cumulative Percentage
InteliGro	46	58.2	58.2
Laeveld Agrochem	1	1.3	59.5
Nulandis	14	17.7	77.2
Wenkem	9	11.4	88.6
Other	9	11.4	100.0
Total	79	100.0	

Question 12 was designed to determine which channel they predominantly follow when procuring their Crop Protection Inputs, considering the traditional business model (sale via Crop Advisor) compared to other variable options and business models which existed in the market.

The results in Table 35 below indicated that Mega-Sized Commercial Growers focus on transacting with Crop Advisors and Crop Protection Suppliers, and the segment focuses less on direct procurement from Crop Protection Manufacturers (BASF, Bayer, UPL, Villa Crop Protection) or Corporate Agri-Business (for example VKB, Senwes).

The respondents indicated they prefer the channel through Crop Protection Suppliers (53.6%) compared to the traditional model (33.3% sale via Crop Advisor). Our interpretation is that Mega-Sized Commercial Growers should be approached by both Crop Advisor and Crop Protection Supplier Head Office Staff in the negotiations and business proposals.

Table 35: From whom do you procure your agricultural crop protection products?

	Frequency	Per cent
Crop Advisor (previously known as Agent)	23	33.3
Crop Protection Supplier (i.e. Nulandis, LAC, Wenkem, InteliGro)	37	53.6
Crop Protection Manufacturer (i.e. BASF, Bayer, Corteva, Villa Crop Protection, UPL)	3	4.3
Corporate Agricultural Business (i.e. Afgri, Kaap Agri, Senwes, VKB)	6	8.7
E-commerce	0	0.0
Total	69	100.0

Table 36 represents results which indicate what products are procured through the channels represented in Table B3.11, which show a fair distribution amongst what a Crop Protection Supplier should offer to producers in this segment. Majority respondents in Corporate Agri-Business focused on Crop Protection Products and Specialised Plant Nutrition (89%) and less on Granular Fertilizers. Crop Protection Suppliers should focus their product positioning and offer to these segments.

Table 36: Which products do you procure from the channels selected above?

	Frequency	Per cent
Crop Protection Products (i.e. herbicides, insecticides, fungicides, nematicides)	38	32.2
Specialised Plant Nutrition (i.e. foliar feeds, bio-stimulants, fertigation)	31	26.3
Crop Protection and Specialised Plant Nutrition	36	30.5
Granular fertilizers	13	11.0
Total	118	100.0

Table 37 aims to understand what procurement policy exists in the various segments. The results below indicated that Mega-Sized Commercial Growers follow own purchase decision-making procurement policy, with a limited focus towards following a tender policy or being directed by a Buying Group. It would be considered that Mega-Sized Commercial Growers are large scale, and due to their scale, they believe that their negotiations would be prudent to procure to their best benefit. They, however, do differ from the Corporate Agri-Business, where appetite still exists to form part of tender and buying group procurement policy.

Table 37: Which of the following statements best reflect your purchasing of Crop Protection Inputs?

	Frequency	Per cent
Own purchase decision	41	78.8
Buying group	5	9.6
Tender	6	11.5
Total	52	100.0

C: Medium and large-sized commercial farmers

The results for the Medium and Large Sized Commercial Growers' profile and segment indicate that majority decision-making authority lies with the owners (45.8%). The owners in this segment play a more significant role in the day-to-day operations and decision-making, compared to the Mega-Sized Commercial Growers' segment where it is combined with a formalised structure in management.

Table 38: Position you hold in the company or farm

Position	Frequency	Per cent
Farm Manager	6	12.5
General Manager	3	6.3
Managing Director	15	31.3
Owner	22	45.8
Production Manager	1	2.1
Technical Manager / Director	1	2.1
Total	48	100.0

Table 39 represents that various legal structures exist in this segment, with majority Private Companies supporting the above results in Table C3.1 that decision-making authority lies within an owner structure. The results in this segment for the legalised structure is much more diverse compared to the Mega-Sized Commercial Growers segment.

Table 39: Legalised structure

	Frequency	Per cent
Close Corporation	9	18.8
Individual company	5	10.4
Partnership	6	12.5
Private company (i.e. (Pty) Ltd)	27	56.3
Trust	1	2.1
Total	48	100.0

The shareholding structure of the Medium and Large Sized Commercial Grower segment presented in Table 40 to Table 43 indicates that this segment has a majority (83.1% own shareholding). The % own shareholding represents a higher % compared to the Mega-Sized Commercial Growers, supporting the results found in Table 38 where the owner is the decision-maker and involved in day-to-day operation. Where external shareholding exists, the shareholding % varies. External investments from foreign entities and BBBEE compliance in this segment is limited and exploratory.

Table 40: Shareholding structure

	Frequency	Per cent
100% own shareholding	40	83.1
External shareholding	8	16.7
Total	48	100.0

Table 41: External ownership shareholding %

	Frequency	Per cent
>50.1%	3	4.2
0.1 - 25%	1	2.1
25.1% - 50%	4	14.6
Total	8	100.0

Table 42: Foreign entity ownership %

	Frequency	Per cent
0.1% - 25.0%	1	2.1
Total	1	100.0

Table 43: BBBEE shareholding %

	Frequency	Per cent
>50.1%	3	6.3
0.1 - 25%	2	4.2
N/A	43	89.5
Total	48	100.0

Table 44 below represents to which extent the Medium and Large Sized Commercial Growers cultivate their crops only in their geographical area or have a National Footprint (that is, operating in more than one province). The data below indicates that all growers cultivate their crops in one province (different geographical areas within the province).

Table 44: Provinces they cultivate their Crops

	Frequency	Per cent
Gauteng	1	2.1
Limpopo	6	12.5
Mpumalanga	3	6.3
North West	2	4.2
Northern Cape	2	4.2
Eastern Cape	1	2.1
Free State	8	16.7
Western Cape	25	52.1
	48	100.0

Table 45 represents the crops cultivated, the total hectares per crop and established to which extent the Medium and Large Commercial Growers are diversified. The results indicated that in this segment, 33 out of the 48 (69%) respondents focus on single-crop cultivation with less diversification focus. Diversification is classified as exploratory in this segment, as growers in this sector indicated that 21% had been diversified in their crop cultivation. The total hectares in this segment is also significantly lower compared to the previous segments, which reflect that this segment is close to scale and exploring diversification.

Table 45: Hectares per crop cultivated (Irrigated / Dry Land)

	Potatoes - Ha Irrigated	Potatoes - Ha Dry Land	Vegetables (Cruciferae, cucurbits, carrots) - Ha Irrigated	Pome Fruit (Apples, Pears) - Ha Irrigated	Minor crops (Blueberries) - Ha Irrigated	Tree Nuts (Pistachios, Macadamias, Pecan) - Ha Irrigated
Hectares	Frequency	Frequency	Frequency	Frequency	Frequency	Frequency
0-499 hectares	2	1	2	3	1	6
Total	2	1	2	3	1	6

	Oilseeds (Canola, Sunflower, Soya Beans) - Ha Irrigated	Oilseeds (Canola, Sunflower, Soya Beans) - Ha Dry Land	Citrus - Ha Irrigated	Summer Row Crops (Maize, Sorghum, Dry Beans) - Ha Irrigated	Summer Row Crops (Maize, Sorghum, Dry Beans) - Ha Dry Land	Stone Fruit (Peaches, Plums) - Ha Irrigated
Hectares	Frequency	Frequency	Frequency	Frequency	Frequency	Frequency
0-499 hectares	5	6	1	7		2
500 - 999 hectares	3	3		3	4	
1000 - 1999 hectares		3		2	2	
2000 - 2999 hectares		2			1	
4000 - 4999 hectares					1	
Total	8	14	1	12	8	2

	Sub-tropical (Avo's, litchis, mango's) - Ha Irrigated	Tomatoes (Table and Processed) - Ha Irrigated	Wine Grapes - Ha Irrigated	Wine Grapes - Ha Dry Land	Winter Cereals (Wheat, Barley, Oats) - Ha Irrigated	Winter Cereals (Wheat, Barley, Oats) - Ha Dry Land
Hectares	Frequency	Frequency	Frequency	Frequency	Frequency	Frequency
0-499 hectares	2	2	6	1	5	1
500 - 999 hectares					1	4
1000 - 1999 hectares	1				3	7
2000 - 2999 hectares					1	3
Total	3	2	6	1	10	15

	Onions - Ha Irrigated	Total
Hectares	Frequency	Frequency
0-499 hectares	1	54
500 - 999 hectares		18
1000 - 1999 hectares		18
2000 - 2999 hectares		7
4000 - 4999 hectares		1
Total	1	98

Table 46 focuses on how Medium and Large Sized Commercial Growers finance their Crop Protection Inputs. The results below indicated that this segment could be viewed as cash-tight with a significant focus on financing from Financial Institutions and Corporate Agricultural Businesses, with a heightened focus (41.7%) on the latter financial option.

Table 46: How do you finance the purchases of your crop protection products?

Type of Financing	Frequency	Per centage
Financial Institution / Commercial Banks (for example. Landbank, Standard Bank, Absa, FNB)	14	29.2
Own funding	14	29.2
Corporate Agricultural Business / Company (for example. Afgri, BKB, Eastern Cape Co-Op, OVK, VKB, Senwes)	20	41.7
Total	48	100.0

Table 47 represents the results where Medium and Large Sized Commercial Growers procure their Crop Protection Products. This question aimed to establish whether this segment only focuses on one Crop Protection Supplier or multiple Suppliers. The results below can be summarised as follows: This segment mainly procures from National Crop Protection Suppliers (88.9%) and predominantly focuses on one channel (35 out of 48 respondents: 73%), which can be viewed that this segment is relationship and reputable Crop Protection Supplier orientated. They are less business orientated compared to the Corporate Agri-Business and Mega-Sized Commercial Growers segments.

Table 47: Procurement of Crop Protection Inputs

	Frequency	Per cent	Cumulative Percentage
InteliGro	40	63.5	63.5
Laeveld Agrochem	5	7.9	71.4
Nulandis	9	14.3	85.7
Wenkem	2	3.2	88.9
Other	7	11.1	100.0
Total	63	100	

Question 12 was designed to determine which channel they predominantly follow when procuring their Crop Protection Inputs, considering the traditional business model (sale via Crop Advisor) compared to other variable options and business models which existed in the market.

The results in Table 48 below indicated that Medium and Large Sized Commercial Growers focus on transacting with Crop Advisors and Crop Protection Suppliers. The segment focuses significantly less on direct procurement from Crop Protection Manufacturers (BASF, Bayer, UPL, Villa Crop Protection) or Corporate Agri-Business (for example VKB and Senwes), compared to the Corporate Agri-Business and Mega-Sized Commercial Growers segments.

The respondents indicated that they balance the relationship between the Crop Advisor and the Crop Protection Suppliers. We view that Medium and Large Sized Commercial Growers should be approached by both Crop Advisor (as the main person) and Crop Protection Supplier Head Office Staff (supporting role) in the negotiations and business proposals. This segment indicates that there are a higher reliance and support for the traditional business model.

Table 48: From whom do you procure your agricultural crop protection products?

	Frequency	Per cent
Crop Advisor (previously known as Agent)	24	45.3
Crop Protection Supplier (i.e. Nulandis, LAC, Wenkem, InteliGro)	25	47.2
Crop Protection Manufacturer (i.e. BASF, Bayer, Corteva, Villa Crop Protection, UPL)	1	1.9
Corporate Agricultural Business (i.e. Afgri, Kaap Agri, Senwes, VKB)	3	5.7
E-commerce	0	0.0
Total	53	100.0

Table 49 represents results which indicate what products are procured through the channels represented in Table C3.11, which represent a fair distribution amongst what a Crop Protection Supplier should offer to producers in this segment. Majority respondents in Corporate Agri-Business focused on Crop Protection Products and Specialised Plant Nutrition (85.1%) and less on Granular Fertilizers. Crop Protection Suppliers should focus their product positioning and offer to these segments.

Table 49: Which products do you procure from the channels selected above?

	Frequency	Per cent
Crop Protection Products (i.e. herbicides, insecticides, fungicides, nematicides)	38	40.4
Specialised Plant Nutrition (i.e. foliar feeds, bio-stimulants, fertigation)	21	22.3
Crop Protection and Specialised Plant Nutrition	21	22.3
Granular fertilizers	14	14.9
Total	94	100.0

Table 50 aims to understand what procurement policy exists in the various segments. The results below indicated that Medium and Large Sized Commercial Growers follow own purchase decision-making procurement policy, with a narrow focus towards following a tender policy or being directed by a Buying Group. The results below support our conclusion of the value of the relationship in business decision-making compared to highly business orientation negotiations.

Table 50: Which of the following statements best reflect your purchasing of Crop Protection Inputs?

	Frequency	Per cent
Own purchase decision	45	93.8
Buying group	1	2.1
Tender	2	4.2
Total	48	100.0

The above results can be summarised in Table 51 below.

Table 51: Summary of segmentation questions

Category	CORPORATE AGRI-BUSINESSES	MEGA-SIZED COMMERCIAL GROWERS	MEDIUM & LARGE SIZED COMMERCIAL GROWERS
Description	Large scale farming with value chain integration. Corporate business structure.	Large scale farming with value chain integration. Management structure and strong owner involvement.	Medium & Large scale farming with no value chain integration. Majority of owner-managed units.
Positional decision-makers	Managerial / Director level	Owner / Management	Owner / Management
Legalised structure	Company / Agricultural Business	Various	Various
Ownership structure	Majority 100% owned + external shareholding	Majority 100% owned - limited external shareholding	Majority 100% owned - limited external shareholding
External shareholding	Significant if applicable	Varies	Limited
Foreign shareholding	Varies	Limited	Limited
BBBEE shareholding	Varies	Limited & exploratory	Limited
Demographics	Multiple farms in different geographical regions, mainly in one province, although multiple provinces also applicable.	Operation mainly in one province, with limited extension to other provinces - exploratory to National.	Local, geographical area.
Crop cultivation	Diversified, multiple crops, majority irrigation and export orientation.	Diversified, multiple crops, sustainable.	Mainly one crop dimension. Diversification exploratory.
Finance activities	Cash-rich, own funding majority & utilisation of financial institutions.	Less Cash-rich, combination of own, financial institutions and Agricultural Business (VKB, Senwes).	Cash-tight, close relationship with Agricultural Business (VKB, Senwes) and Financial Institutions.
Crop Protection Channel purchases	Majority National Distributors, multiple channels and partners.	Majority National Distributors, limited other channels and partners.	Mainly through one Crop Protection Supplier.
Channel procurement preference	Crop Protection Supplier (less dependence on Crop Advisor).	Crop Protection Supplier (Main) and Crop Advisor (Support).	Crop Advisor (Main) and Crop Protection Supplier (Support).
Technical Advice channel	Independent	Varies	Crop Advisor
Crop Protection purchases	> R10,0 MIO	<R10,0 MIO	R2,0 - R10,0 MIO
Scale	MEGA. OWN DECISION-MAKING, Limited tender orientation, not part of a buying group.	LARGE TO MEGA, strong involvement by owner/managing director in decision-making, a higher trend towards tender and buying groups.	Average, own decision-making, less tender and buying group orientated.
Profile	Buying decisions typically made by managers/directors rather than owners. Business orientated & strong differentiation. Buy direct from Crop Protection Supplier - negotiation customisation required.	Buying decisions typically made by owners/directors/management. Business Orientation, buying directly from Crop Protection Suppliers - an investigation into other channels - exploratory towards Manufacturers and Agricultural Businesses.	Owner= Grower= Decision maker. Entrepreneurial, Innovative, Progressive & Diversification exploration. Relational focus on Crop Advisor and Crop Protection Supplier channels.

Section 2: Factors influencing the buying decision of each segment

Question 17 – 21: Procurement patterns and which factors influence the decision-makers in their choice of procuring Crop Protection based on the needs/requirements of the segment

Question 17: What are the main factors which impact your decision when procuring your inputs from an Agricultural Crop Protection Supplier (for example, InteliGro, Nulandis, LAC, Wenkem)? (Where Essential = 5, Extremely Important = 4, Important = 3, Somewhat Important = 2, Not Important = 1).

Table 52: Procurement patterns

	Corporate Agri-Business			Mega-Sized Commercial Growers			Medium and Large Commercial Growers		
	Mean	Standard Deviation	Rank	Mean	Standard Deviation	Rank	Mean	Standard Deviation	Rank
Relationship, trust and advice of the Crop Advisor (previously known as Agent)	3.60	0.97	11.00	4.45	0.90	2.00	4.24	1.05	2.00
Relationship, trust, brand of Crop Protection Supplier (for e.g. InteliGro, Nulandis, LAC, Wenkem)	3.80	1.03	8.00	3.66	1.05	16.00	3.52	1.06	13.00
Quality of product	4.80	0.42	1.00	4.68	0.56	1.00	4.50	0.74	1.00
Complete crop solution	3.70	1.16	9.00	4.17	1.07	7.00	3.76	1.10	11.00
Price	4.10	0.74	6.00	4.34	0.76	3.00	4.02	0.98	4.00
Multi-National Corporate Brand (Research / Reputation - i.e. from Bayer, Syngenta, Corteva)	3.20	0.63	17.00	3.02	1.09	20.00	3.05	1.25	19.00
Multi-National Corporate Brand (Product Name - for e.g. Roundup)	3.20	0.79	17.00	3.19	1.14	18.00	3.26	1.11	15.00
Generic Product (due to efficacy and price)	2.80	1.14	20.00	3.13	1.08	19.00	3.19	0.89	17.00
Advice received from Independent Advisor	3.70	0.95	9.00	4.06	0.94	10.00	3.95	1.06	7.00
Advice received from Crop Advisor (previously known as Agent)	3.30	1.25	16.00	4.06	0.99	10.00	4.21	0.84	3.00
Integrated Pest Management Practices	4.00	0.82	7.00	4.32	0.78	4.00	3.79	0.98	10.00
Market Access (Minimum Residue Profile)	4.70	0.67	2.00	4.23	1.00	5.00	3.86	1.05	8.00
Traceability of product	4.50	0.85	4.00	3.89	1.17	12.00	3.62	0.94	12.00
Logistical compliance and efficacy	4.60	0.52	3.00	4.11	0.87	8.00	3.81	0.92	9.00

	Corporate Agri-Business			Mega-Sized Commercial Growers			Medium and Large Commercial Growers		
	Mean	Standard Deviation	Rank	Mean	Standard Deviation	Rank	Mean	Standard Deviation	Rank
Access to data (historic and current)	3.40	1.17	14.00	3.72	0.97	15.00	3.24	0.93	16.00
Funding	2.30	1.06	21.00	3.26	1.28	17.00	2.90	1.36	20.00
Technical support / expertise	3.60	1.26	11.00	4.21	0.83	6.00	4.00	0.86	6.00
Supplier Support	4.20	0.92	5.00	4.09	0.88	9.00	4.02	0.84	4.00
Empty container removal	3.10	1.60	19.00	2.87	1.38	21.00	2.60	1.25	21.00
Technology (Disease models, Data-management platform)	3.40	1.07	14.00	3.77	1.05	14.00	3.07	1.07	18.00
Biological solution	3.60	1.26	11.00	3.89	0.98	12.00	3.36	1.16	14.00

The results in the table above are consolidated based on the respondent feedback. The mean scores were ranked based on importance level indicated in the questions. The results above clearly indicate that significant differences exist between the Corporate Agri-Business segment and the other two segments. There is one similarity among the three segments, which is represented with the essential scoring of Product Quality and is rated amongst all three segments as the essential factor when procuring inputs from Crop Protection Suppliers.

There are eight (8) factors that are similar in importance levels between the Mega-Sized Commercial Growers Segment and the Medium and Large Commercial Growers segments, indicating that there are similarities between the decisions which are important when considering procuring inputs. However, these similarities represent a scoring of 38% out of the total 21 questions.

Per Segment Preferential Buying Decisions per Mean scoring ranked

Figure 9: Corporate agri-business



Figure 10: Mega-Sized Commercial Growers

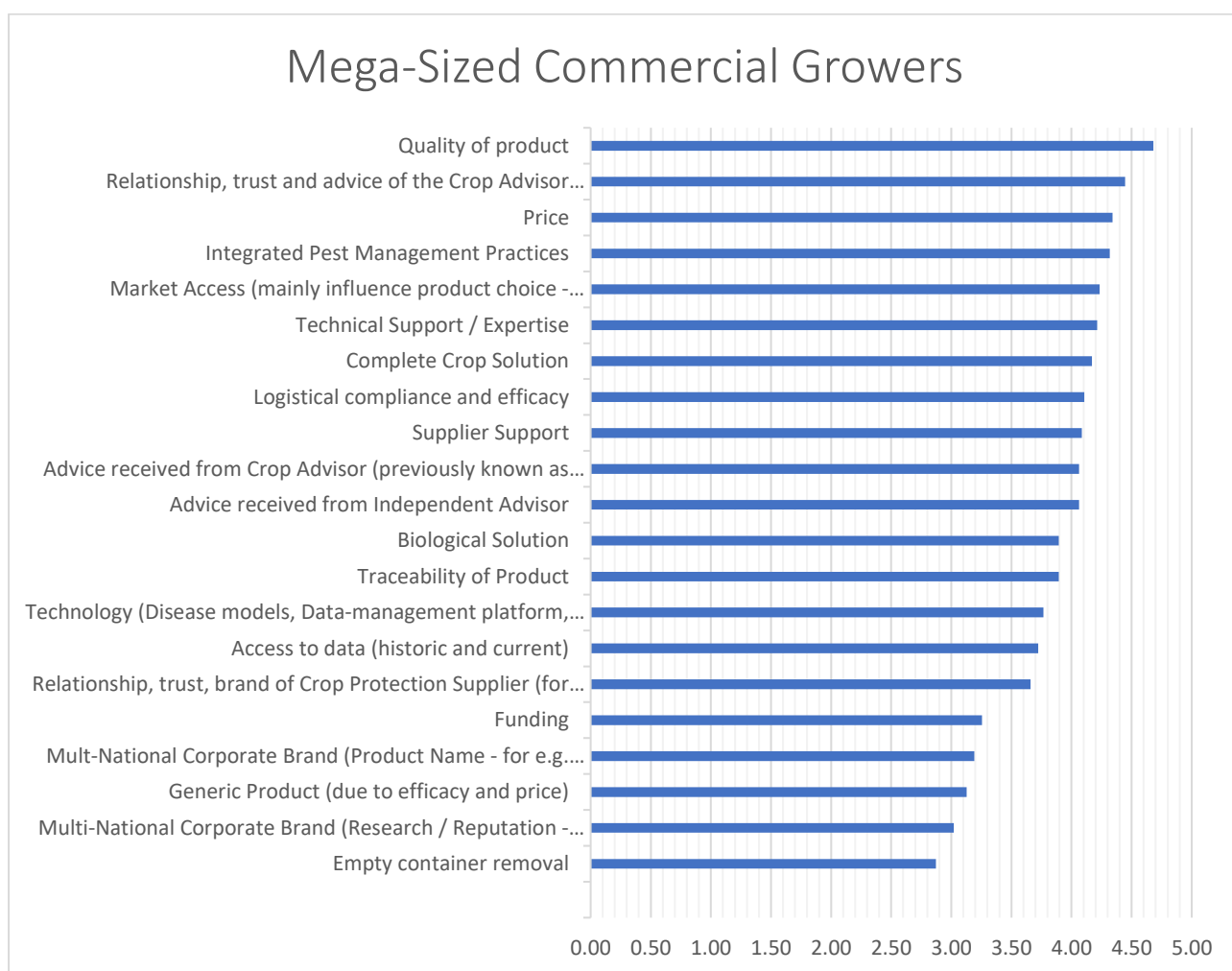
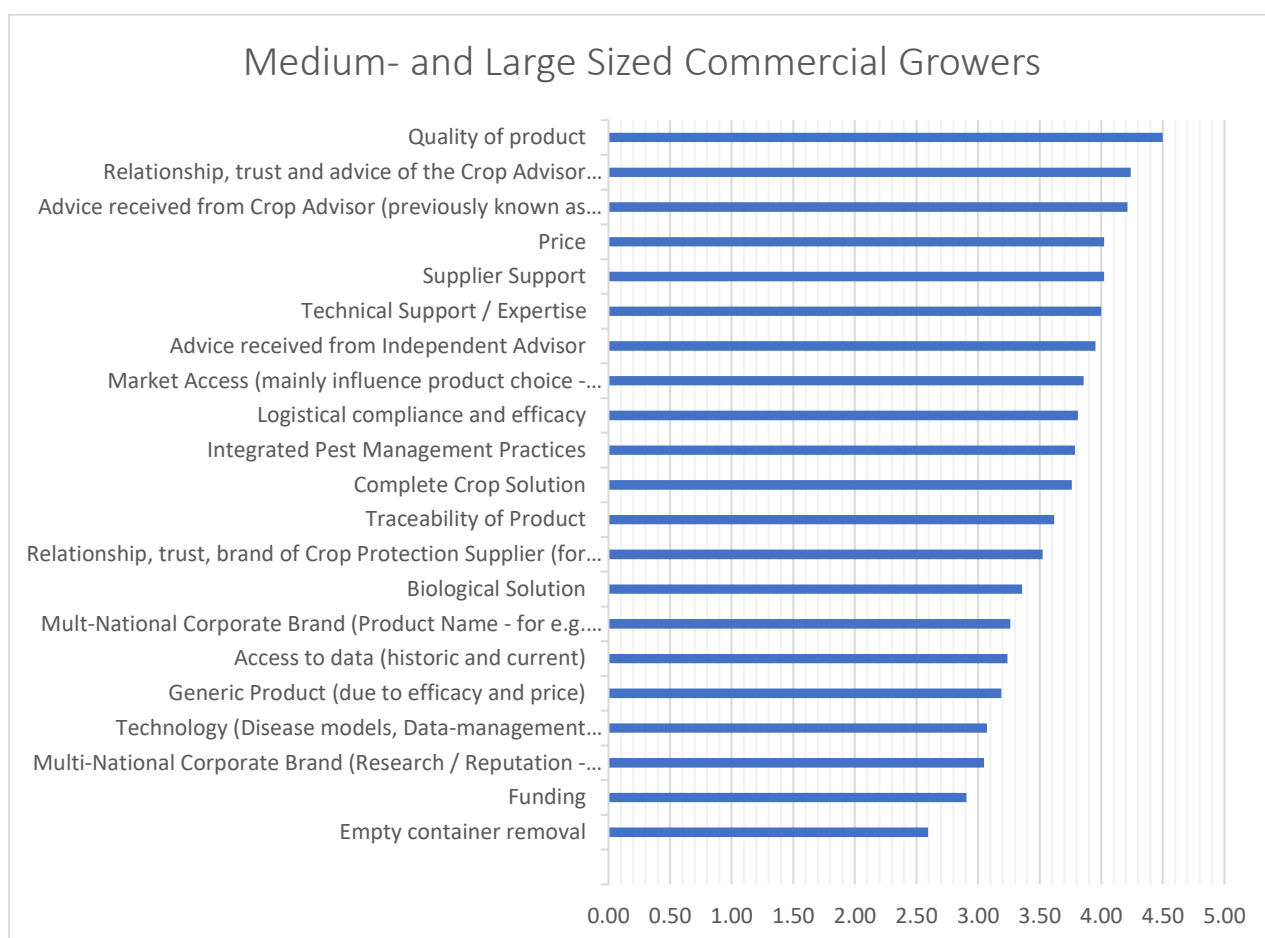


Figure 11: Medium- and Large-sized Commercial growers



The results represent that each segment's needs and wants differ when considering which factors are of importance in their procurement decision for agricultural inputs from Crop Protection Suppliers.

Table 53: Question 18: Rate the level of service that you receive from your Crop Advisor (previously known as agent) – rate each category (Excellent = 5, Good = 4, Acceptable = 3, Moderate = 2, Poor = 1)

Category	Corporate Agri-Business			Mega-Sized Commercial Growers			Medium and Large Commercial Growers		
	Mean	Standard Deviation	Rank	Mean	Standard Deviation	Rank	Mean	Standard Deviation	Ranking
Technical expertise	4.00	0.94	7.00	4.36	0.76	2.00	4.45	0.59	3.00
Experience	4.20	0.63	4.00	4.30	0.86	4.00	4.50	0.55	2.00
Involvement in community	3.90	0.88	9.00	4.13	0.92	7.00	4.12	0.83	8.00
Solutions focused	4.10	0.88	5.00	4.28	0.68	5.00	4.31	0.68	5.00
Commercial Offer	4.10	0.88	5.00	4.04	0.75	9.00	4.07	0.75	9.00
Future orientation	4.00	0.94	7.00	4.17	0.84	6.00	4.19	0.74	7.00
Open, honest, trustworthy	4.50	0.53	1.00	4.51	0.69	1.00	4.55	0.67	1.00
Logistic effectiveness	4.30	0.67	2.00	4.00	0.91	10.00	4.24	0.62	6.00
Market access support	3.90	0.99	9.00	4.13	0.92	7.00	4.02	0.72	10.00
Supportive technology	3.70	1.06	11.00	3.77	1.15	11.00	3.69	1.02	11.00
Professionalism	4.30	0.67	2.00	4.36	0.79	2.00	4.33	0.72	4.00
Average	4.09			4.19			4.23		

Similarities in the segments exist on four levels: solutions focused, open, honest, trustworthy and supportive technology. Supportive technology should be noted and the mean are between acceptable and good. This should be of concern to Crop Protection Suppliers.

The average means score across all three segments present a good rating for the crop advisor experience; however, a higher moderate means was presented in the Medium and Large Commercial Growers segment. We noted in the segmentation and results for Section 1 above that the Medium and Large Commercial Grower segment has a more relationship-focused business orientation compared to the other segments, which is supported by the higher average means scoring.

We have highlighted some of the concerns in orange above and will focus our interpretation thereof below:

Segment: Corporate Agri-Business (Market Access Support)

Market Access Support with a ranking of 9 and means between acceptable and good. In Question 17 (what factors impact your procurement decision) this segment's rated market access (Minimum Residue Profile) as their second most important factor. This presents the scenario that there is a negative correlation between the factor influencing the decision and the support given by the Crop Advisor.

The results above indicate a disjuncture between the expectation from the growers and the rating given to the Crop Advisor. This proposes that the growers in this segment might require the services of others to advise on the proper product use to manage market access (Minimum Residue Levels). In practice, the use of Independent Advisors or Consultants specifically by those growers who export their products is a well-known phenomenon, with specific reference to access market information and to provide advice on the product used to manage Minimum Residue Levels based on their specific export market.

In Question 17, this segment ranked the advice from an Independent Advisor as 9th on their priority factors when considering procuring Crop Protection Inputs with a ranking of Supplier Support as their 5th priority and relationship, brand, and the trust of Crop Protection Supplier as 7th priority. We would suggest that this segment would require the Crop Protection Suppliers to provide them with market access support, advice and product positioning.

Segment: Mega- and Medium and Large Sized Commercial Growers (Commercial Offer)

Both these segments scored Commercial Offer received from their Crop Advisor as good with a means of 4.07, which ranked 9th out of 11. In Question 17 above, both these segments rated price respectively 3rd and 4th importance in considering procuring Crop Protection Inputs.

There is a disjuncture between the needs of these segments compared to the rating provided to the Crop Advisor for Commercial offering. This would suggest that these segments require either an improvement from their Crop Advisor or that other parties should be involved in the Commercial Offer. Relationship, trust and advice received from Crop Advisor rank in both segments as 2nd and 3rd top priority when considering procuring Crop Protection Inputs. It would thus be advisable that Crop Protection Suppliers should improve the commercial skills of their Crop Advisors who service these segments.

Table 54: Question 19: Business Proposal: How important are the following to you as a producer and in the decision-making process to procure Crop Protection Products? (where 1 = least important, 7 = most important)

	Corporate Agri-Business			Mega-Sized Commercial Growers			Medium and Large Commercial Growers		
	Mean	Standard Deviation	Rank	Mean	Standard Deviation	Rank	Mean	Standard Deviation	Rank
Business terms	5.50	1.90	3.00	5.83	1.42	2.00	5.71	1.40	1.00
Funding initiatives	4.60	2.55	7.00	4.57	2.01	8.00	4.26	1.99	8.00
Discount on cash payment	6.00	1.49	2.00	5.57	2.02	4.00	5.60	1.59	3.00
Discount - volume	6.40	0.97	1.00	6.47	0.91	1.00	5.62	1.65	2.00
Rebates	4.50	2.68	8.00	5.21	1.92	5.00	4.76	1.88	5.00
Loyalty programmes	4.70	2.31	6.00	5.00	2.16	7.00	4.50	2.21	7.00
Bulk / container purchases	5.00	1.63	5.00	5.19	1.69	6.00	4.57	1.91	6.00
Financial solutions	3.10	1.52	9.00	4.38	1.88	9.00	4.26	2.02	9.00
Guarantee on claims made from recommendations	5.20	1.87	4.00	5.60	1.84	3.00	5.38	1.87	4.00
Average means	5.00			5.31			4.96		

Differences exist between the three segments based on the business proposals which are deemed important in procuring Crop Protection Products. The similarities between all three segments in the means and rank in priority are more aligned compared to Question 17 and 18 above.

Highlighted above is the importance of Discounts in volume and Discount on cash payment purchases for all three segments, with a lesser means scoring in Medium and Large Commercial Growers, who prioritise business terms as their top consideration in the business proposal submitted.

A new business proposal was prioritised and ranked in all three segments as 4th most important factor at a means of 5.2, 5.6 and 5.38 respectively. It is the guarantee on claims made from recommendations (put your money where your mouth is). This is a new concept which does not form part of the current business models and business proposals submitted by Crop Protection Suppliers in South Africa.

The prioritisation of funding initiatives (means 4.6, 4.57, 4.26) and financial solutions (means 3.1, 4.38, 4.26) amongst all three segments were in the lowest quadrant of importance, although funding initiatives (collaboration with Corporate Agricultural Business such as VKB, Senwes, Overberg Agri) scored higher compared to financial

solutions (for example Cultivault and Agrisafe). It is also noted that the financial solutions had little to no importance in the Corporate Agri-Businesses segment, but was somewhat important in the other two segments.

Table 55: Question 20: Price Policy: Which statement BEST describes your view on the pricing and decision-making on procuring Crop Protection Products? (Totally Disagree = 1, Disagree = 2, Somewhat Agree = 3, Agree = 4, Totally Agree = 5)

	Corporate Agri-Business			Mega-Sized Commercial Growers			Medium and Large Commercial Growers		
	Mean	Standard Deviation	Rank	Mean	Standard Deviation	Rank	Mean	Standard Deviation	Rank
Lowest Price	3.30	1.49	4.00	3.36	1.05	4.00	3.14	1.18	4.00
Market-related	4.10	0.88	3.00	4.06	0.73	1.00	3.88	0.92	1.00
Tender policy	3.00	1.49	5.00	2.96	1.32	5.00	2.52	1.09	5.00
Customised (as negotiated)	4.30	0.82	1.00	3.81	0.97	3.00	3.48	1.19	3.00
Price Benchmarking	4.20	0.79	2.00	3.98	1.05	2.00	3.74	1.11	2.00
Average	3.78			3.63			3.35		

The above results present that differences exist between the Corporate Agri-Business and the other two segments with their view on price policy.

Similarities in the three sectors reflect where they **agree** that price benchmarking is one of the factors which best describe their procurement price policy and that they **somewhat agree** to **disagree** that a tender policy best describes their procurement price policy.

Price Benchmarking and Market-related procurement price policies best describe the Mega-Sized Commercial - and Medium and Large Sized Commercial Growers segments, compared to customised (as negotiated) procurement price policy for Corporate Agri-Business.

It was interesting to note that all three segments somewhat agreed to disagree that the lowest price best describe their procurement price policy and ranked at the 2nd lowest quadrant of the pricing policy statements.

Table 56: Question 21: Looking into the future how would you prefer to purchase your Crop Protection Products? Rate according to relevance (where 1 = least relevant, 7 = most relevant)

	Corporate Agri-Business			Mega-Sized Commercial Growers			Medium- and Large Commercial Growers		
	Mean	Standard Deviation	Rank	Mean	Standard Deviation	Rank	Mean	Standard Deviation	Rank
Traditional Channel through Crop Advisor (previously known as Agent)	4.70	2.26	3.00	5.36	1.85	1.00	5.90	1.39	1.00
Split Advice and Product - pay separate for advice and product	5.00	2.21	2.00	3.57	2.46	4.00	3.29	2.13	4.00
Direct from Crop Protection Manufacturer (i.e. Basf, Bayer, Villa Crop Protection)	5.90	1.45	1.00	4.68	2.13	2.00	4.60	1.99	2.00
Direct from Crop Protection Supplier (i.e. InteliGro, LAC, Nulandis, Wenkem)	4.70	2.36	4.00	4.40	2.34	3.00	4.02	2.12	3.00
Direct through Buying Group	2.70	1.70	5.00	3.15	2.21	6.00	2.98	2.04	6.00
Direct from Cooperative / Agricultural Business (i.e. VKB, Senwes, Kaap Agri)	2.30	1.34	7.00	3.04	2.01	7.00	3.14	1.86	5.00
E-commerce (online platform i.e. Takealot)	2.30	1.06	6.00	3.21	2.32	5.00	2.69	2.10	7.00

The question aims to understand which model in the future should be considered in each of these segments and what other channels exist which pose a threat to the sustainability of Crop Protection Distributors. It should be noted that the Crop Protection Distribution is seen as the “middle-man” in the industry and producers would always attempt to shorten the chain to be cost-competitive and believe best prices are obtained through eliminating the middle-man/eliminating duplicated costs in the channel.

It can be argued that manufacturers could sell directly to growers and eliminate the current distribution channel. Business models have evolved where manufacturers sell directly to growers. These manufacturers are usually those who are unable to establish a network through distribution and aim to gain market share in the product, promotion, placement, and pricing. These are typically new entrants into the market or those who have a niche market. There are those manufacturers who do not share this profile, who have sold directly to growers through buying groups, Tenders and Cooperative Purchases. Manufacturers to note are Villa Crop Protection, BASF and Bayer (through their Dekalb seed).

If manufacturers choose to sell directly to growers, they will now be required to close all the market gaps, which will require additional costs to be incurred. The marketing tasks or closing the market gaps are not eliminated and are merely shifted from Distribution to Manufacturing (Tamilia & Charlebois, 2009).

The results above indicate that there is an appetite amongst all segments in the future to procure their Crop Protection Products directly from the manufacturer. This poses a risk to Crop Protection Distributors, one which cannot be underestimated or ignored.

The fact that all these segments indicated that they would consider procuring directly from manufacturers could imply that they do not see the value of the Distribution channel, and it would be advisable for Crop Protection Distributors to educate and demonstrate the value proposition towards growers.

It was interesting to note that the Corporate Agri-Business segment indicated a means of 5.00 that a new model would be considered where sales should occur, where the product procured is split from the advice. This would be a new model if adopted by Crop Protection Distributors if this model only exists where Independent Consultants/Advisors are appointed, and product procured from the Crop Protection Distributor.

The traditional business model employed by Crop Protection Distributors seems to follow high relevancy from the Mega-Sized Commercial Growers segment and the Medium and Large Sized Commercial Growers.

The e-commerce model scored a low to very low relevancy (2.3, 3.21, 2.69) amongst all three segments as a model for future procurement of Crop Protection Products.

Section 3: E-commerce Business Model Evaluation

Question 22 – 23: To determine to what extent the respondents will consider an e-commerce model per segment and what will be their primary objective in following this business model/channel.

Table 57: Question 22: Would you consider purchasing your Crop Protection Products from an online platform (that is, Takealot)?

	Corporate Agri-Business		Mega-Sized Commercial Growers		Medium- and Large Commercial Growers	
	Yes	No	Yes	No	Yes	No
Frequency	3.0	9.0	18.0	29.0	18.0	30.0
Per cent	25.0	75.0	38.3	61.7	37.5	62.5

The frequency based on the consideration to procure from an online platform is low amongst all three segments, with the Mega-Sized Commercial Growers showing the greater appetite and the Corporate Agri-Business segment the least.

Table 58: Question 23: What would be your primary reason for procuring Crop Protection Products from an online platform (i.e. Takealot)? Rate relevance (where 1 = least relevant, 7 = most relevant)

	Corporate Agri-Business			Mega-Sized Commercial Growers			Medium and Large Sized Commercial Growers		
	Mean	Standard Deviation	Rank	Mean	Standard Deviation	Rank	Mean	Standard Deviation	Rank
Bargain-hunting	3.60	2.63	3.00	3.70	2.61	2.00	3.29	2.55	3.00
Transaction (product focus)	4.00	2.36	2.00	3.65	2.57	4.00	3.51	2.33	2.00
Benchmarking	4.10	2.38	1.00	4.11	2.65	1.00	3.83	2.57	1.00
Convenience	3.40	2.17	4.00	3.67	2.58	3.00	3.22	2.34	4.00
Current channel / model not optimal	1.90	1.10	6.00	2.64	2.14	6.00	2.39	1.91	6.00
Other value chain activities (i.e. insurance, technology, seed, fertilizer)	2.70	2.06	5.00	3.00	2.27	5.00	2.88	2.03	5.00

The question aims to address the factors which are important should an e-commerce model be implemented as a business model for Crop Protection Distributors. We already noted that the response to the model has less preference for the traditional models in each of the segments, scoring a frequency below 40%. This is also supported by means of 1.9, 2.14, and 2.39 answered for the current channel/model not optimal across all three segments.

The results above for all the questions from a means are all low compared to the most relevant scoring means of 7. Should this model be accepted and implemented in the future by Crop Protection Distributors the purpose thereof, according to the respondents (all three segments agree), is that it would be most relevant and ranked below:

- Price benchmarking
- Bargain hunting
- Transaction/product focus (looking for a specific product)
- Convenience

Section 4: Segment-specific preference to information and technology

Question 24 – 25: Segment-specific importance to access latest technology and information.

Table 59: Question 24: How important to you is access to the latest technology (Disease forecasting models, scout models, electronic recommendations, Omni-channel models) from Agricultural Crop Protection Companies to support your farming operations? (where 1 = least important, 7 = most important)

	Corporate Agri-Business		Mega-Sized Commercial Growers		Medium and Large Commercial Growers	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Technology	6.00	1.73	5.64	1.76	5.22	1.78

The results above indicated that technology is seen as very important to all three segments, with relevance rating in importance ranked most important to Corporate Agri-Business segment, then Mega-Sized Commercial Growers, and to a lesser degree Medium and Large Commercial growers. The positioning of technology for a Crop Protection Distributor should align with the preference in each of these segments, which focuses on Corporate Agri-Business as primary, should new technology become available.

Table 60: Question 25: Rate the relevance of the following information to you as the grower. (Where 1 = no relevance, 7 = most relevant)

	Corporate Agri-Business			Mega-Sized Commercial Growers			Medium and Large Commercial Growers		
	Mean	Standard Deviation	Rank	Mean	Standard Deviation	Rank	Mean	Standard Deviation	Rank
Research Data - Intellect Solutions, Answer Plots	6.00	1.73	6.00	5.50	1.63	8.00	5.22	1.78	4.00
Market Access - Minimum Residue Levels	6.20	1.79	4.00	5.64	1.76	6.00	5.52	1.59	3.00
Crop specific recommendations	6.60	0.55	1.00	6.09	0.92	1.00	5.78	1.44	1.00
Crop Manuals (Crop Physiology, Products registered)	6.40	0.89	3.00	5.59	1.62	7.00	4.91	1.50	7.00
Innovation Platform (similar to Grain SA)	6.00	1.22	5.00	5.41	1.59	9.00	4.43	1.62	9.00
Industry-specific (i.e. potatoes)	6.60	0.55	1.00	6.00	1.11	3.00	5.00	1.45	5.00
Biological solutions / regenerative agriculture	5.60	2.07	7.00	6.09	1.19	2.00	5.61	1.64	2.00
Personal account and Transactional information platform (current and history)	5.40	1.82	9.00	5.95	1.36	4.00	5.00	1.51	6.00
E-commerce platform to access data and information	5.40	1.34	8.00	5.68	1.62	5.00	4.87	1.36	8.00

The question above aims to address the needs for each segment regarding information which should be supplied to growers by Crop Protection Distributors. Except for the consensus on the importance of crop-specific recommendations amongst all three segments, the information preference and relevance differ amongst the segments. It should also be noted that the means scoring for the Corporate Agri-Business segment are high on all the information options available, reflecting that information is extremely important to this segment.

Section 5: Frequency measure of service levels

Question 26: Frequency measure of service level from Crop Protection Distributors by specific role players.

Table 61: Question 26: Technical / Marketing: How often do you need the services or visits of Crop Advisors (i.e. Agents, Technical Advisors) of Agricultural Crop Protection Suppliers?

Corporate Agri-Business							
	Ad-hoc	Annually	Bi-Annual	Quarterly	Monthly	Weekly	Two-three times weekly
Crop Advisor	1.0	0.0	0.0	1.0	0.0	3.0	0.0
Crop Specialist	0.0	0.0	0.0	2.0	1.0	2.0	0.0
Technical Advisors / Consultants	0.0	0.0	0.0	1.0	2.0	2.0	0.0
Key Account Managers	1.0	1.0	0.0	2.0	0.0	1.0	0.0
Mega-Sized Commercial Growers							
	Ad-hoc	Annually	Bi-Annual	Quarterly	Monthly	Weekly	Two-three times weekly
Crop Advisor	1.0	0.0	2.0	4.0	4.0	10.0	1.0
Crop Specialist	1.0	1.0	0.0	6.0	8.0	5.0	1.0
Technical Advisors / Consultants	2.0	0.0	1.0	4.0	10.0	5.0	0.0
Key Account Managers	7.0	10.0	1.0	2.0	1.0	1.0	0.0
Medium and Large Commercial Growers							
	Ad-hoc	Annually	Bi-Annual	Quarterly	Monthly	Weekly	Two-three times weekly
Crop Advisor	5.0	0.0	1.0	1.0	4.0	10.0	2.0
Crop Specialist	4.0	2.0	3.0	5.0	6.0	3.0	0.0
Technical Advisors / Consultants	7.0	2.0	1.0	6.0	5.0	2.0	0.0
Key Account Managers	9.0	9.0	2.0	2.0	1.0	0.0	0.0

The results highlighted above indicate the preference of each of the segments based on frequency per key personnel within the Crop Protection Distribution. There is do, however, a noticeable trend where the frequency and intensity required by Corporate Agri-Business segment are higher compared to the other two segments, with specific inclusion of Technical Advisors and Key Account Managers. It was also noted that the traditional channel of visits by predominantly the Crop Advisors to the growers has changed, and there is a need to have visits from Technical Advisors and Key Account Managers.

Section 6: Value Chain Integration Analysis

Question 27 – 28: Which segment provides the biggest appetite to integrate backwards with their Crop Protection Distributors, and what will be their primary objective to integrate backwards.

Table 62: Question 27: Would you be interested in acquiring equity in your Crop Protection Supplier (i.e. InteliGro, LAC, Nulandis, Wenkem)?

	Corporate Agri-Business		Mega-Sized Commercial Growers		Medium and Large Commercial Growers	
	Frequency	Per cent	Frequency	Per cent	Frequency	Per cent
Yes	0.0	0.0	14.0	29.8	13.0	27.1
No	12.0	100.0	33.0	70.2	35.0	72.9
Total	12.0	12.0	47.0	100.0	48.0	100.0

The results above indicate that there is some appetite for backwards integration into the value chain with Crop Protection Distributors from the Mega-Sized and Medium and Large Sized Commercial Growers segments, but there is 0% interest from the Corporate Agri-Business segment.

This would not be considered as a significant portion to add to the business models for each of these segments and should be addressed following Grower-specific ad-hoc requests.

Table 63: Question 28: If you answered “yes” to the question above, what would be your main consideration?

	Frequency	Per cent
Integrity	15	12.7
Transparency	14	11.9
Cost synergy	15	12.7
Value chain integration	21	17.8
Gaining valuable information	11	9.3
Partnership	11	9.3
Return on Investment	18	15.3
Stronger commitment	13	11.0
Total	118	100.0

The responses above were consolidated amongst the Mega-Sized Commercial Growers Segment and Medium and Large Commercial Growers Segment. All applicable options could be selected.

The frequency for total responses per category is presented above, while the main consideration to acquire equity in the Crop Protection Distributor is to ensure value chain integration, followed by return on investment, cost synergy and integrity of the company.

3.4 SUMMARY AND CONCLUSION OF RESULTS

The summary and conclusion of the results will focus on whether the secondary research objective has been met, to address them each specifically and whether the research question can be answered.

The construct of the primary research objective has been formulated based on secondary research objectives. Once those secondary research objectives are met through the research results, then conclusions will be made to the extent to which the primary research objective has been met.

The secondary research objectives reported in Chapter 1 are as follow:

- To identify the proper segmentation profile of customers (SRO 1)
- To identify customer segmentation-specific needs and wants (SRO 2)
- To determine whether the e-commerce business model should be adopted (SRO 3)

SRO 1: To identify the proper segmentation profile of customers

Section 1 of the results above summarised the profile of each of the segments identified during this study and are presented below in the three segments: Corporate Agri-Business, Mega-Sized Commercial Growers and Medium and Large Sized Commercial Growers.

Table 64: Profile of the three segments: Corporate Agri-business, Mega-Sized Commercial Growers and Medium and Large Sized Commercial Growers

Category	CORPORATE AGRI-BUSINESS	MEGA-SIZED COMMERCIAL GROWERS	MEDIUM & LARGE SIZED COMMERCIAL GROWERS
Description	Large scale farming with value chain integration. Corporate business structure.	Large scale farming with value chain integration. Management structure and strong owner involvement.	Medium & large-scale farming with no value chain integration. Majority of owner-managed units.
Market size	20 – 25%	15 – 20%	45 – 55%
CP Market Value	R2.0 Billion	R1.5 Billion	R4.5 Billion
Positional decision-makers	Managerial / Director level	Owner / Management	Owner / Management
Legalised structure	Company / Agricultural Business	Various	Various
Ownership structure	Majority 100% owned + external shareholding	Majority 100% owned - limited external shareholding	Majority 100% owned - limited external shareholding
External shareholding	Significant if applicable	Varies	Limited
Foreign shareholding	Varies	Limited	Limited
BBBEE shareholding	Varies	Limited & exploratory	Limited
Demographics	Multiple farms in different geographical regions, mainly in one province, although multiple provinces also applicable.	Operation mainly in one province, with limited extension to other provinces - exploratory to National.	Local, geographical area.
Crop cultivation	Diversified, multiple crops, majority irrigation and export orientation.	Diversified, multiple crops, sustainable.	Mainly one crop dimension. Diversification exploratory.
Finance activities	Cash-rich, own funding majority & utilisation of financial institutions.	Less Cash-rich, combination of own, financial institutions and Agricultural Business (VKB, Senwes).	Cash-tight, close relationship with Agricultural Business (VKB, Senwes) and Financial Institutions.
Crop Protection Channel purchases	Majority National Distributors, multiple channels, and partners.	Majority National Distributors, limited other channels and partners.	Mainly through one Crop Protection Supplier.
Channel procurement preference	Crop Protection Supplier (less dependence on Crop Advisor)	Crop Protection Supplier (Main) and Crop Advisor (Support)	Crop Advisor (Main) and Crop Protection Supplier (Support)
Crop Protection purchases	> R10,0 MIO	<R10,0 MIO	R2,0 - R10,0 MIO
Scale	MEGA. OWN DECISION-MAKING, Less tender - no buying group.	LARGE TO MEGA, strong involvement by owner/managing director in decision-making, a higher trend towards tender and buying groups.	Average, own decision-making, less tender and buying group orientated.
Profile	Buying decisions typically made by managers/directors rather than owners. Business orientated & strong differentiation. Buy direct from Crop Protection Supplier - negotiation required.	Buying decisions typically made by owners/directors/management. Business Orientation, buying directly from Crop Protection Suppliers - an investigation into other channels - exploratory towards manufacturers and Agricultural Businesses.	Owner= Grower= Decision maker. Entrepreneurial, Innovative, Progressive & Diversification exploration. Relational focus on Crop Advisor and Crop Protection Supplier channels.

The four criteria for successful segmentation are substantiality, identifiability and measurability, accessibility, and responsiveness. The results above are evaluated against the criterion in the table below.

Table 65: Successful segmentation measures

Criteria	Measure	Criteria Met
Substantiality: The specific segments should be large enough to develop and maintain a marketing mix (Lamb <i>et al.</i> , 2019).	Corporate Agri-Business: Market Size: 20% to 25% and CP market value: R2.0 Billion Mega-Sized Commercial Growers: Market Size: 15% to 20% & CP market value: R1.5 Billion Medium and Large Sized Commercial Growers Market Size: 45% to 55% CP Market value: R4.5 Billion	Yes
Identifiability and measurability	See table above for demographics, profile, crop cultivation, legalised structure.	Yes
Accessibility: must be able to reach the members	InteliGro is a National Crop Protection Distributor with 109 Crop Advisors. See the demographics of segment members, those who cultivate crops in multiple provinces can be reached through the network.	Yes
Responsiveness	Each of the segments is homogeneous within the segment, but is heterogeneous among the three segments.	Yes

Based on the successful segmentation criteria and the summarised information per segment, it can be concluded that SRO 1 was met.

SRO 2: To identify customer segmentation-specific needs and wants

Section 2 followed the pattern to determine the needs and wants of each of the segments with structure questions to determine the main factors impacting each segments' decision-making in procuring Crop Protection Inputs.

The results represent that each segment's needs and wants differ when considering which factors are of importance in their procurement decision for agricultural inputs from Crop Protection Suppliers. Only one (1) factor (Product Quality) out of the 21 factors listed were homogeneous amongst all three segments. Eight (8) factors were homogeneous between the Mega-Sized Commercial Growers and the Medium and Large Commercial Growers Segments out of the 21 factors listed.

When considering the channel through which the Crop Protection Distributors should market their products, the rating of the service level through the traditional channel (Crop Advisors) presented the following:

The average means score across all three segments present a good rating for the crop advisor experience; however, a higher average means was presented in the Medium and Large Commercial Growers segment. The traditional channel with slight modification would deem to be the appropriate channel for Medium and Large Commercial Growers.

In the Corporate Agri-business there was a disjunction between the expectation from the growers and the rating given to the Crop Advisor. This proposes that the growers in this segment might require the services of others to advise on the proper product use to manage market access (Minimum Residue Levels).

In the Mega-Sized Commercial Growers and Medium and Large Commercial Growers Segments, there is a disjuncture between the needs of these segments compared to the rating provided to the Crop Advisor for Commercial offering. This would suggest that these segments require either an improvement from their Crop Advisor or that other parties should be involved in the Commercial Offer. Relationship, trust and advice received from Crop Advisor rank in both segments as 2nd and 3rd top priority when considering procuring Crop Protection Inputs. It would thus be advisable that Crop Protection Suppliers should improve the commercial skills of their Crop Advisors who service these segments.

The channel to be used by Crop Protection Distributors to both Corporate Agri-Businesses and Mega-Sized Commercial Growers would require a change in the traditional model. In this regard, an increased involvement and even direct marketing strategy have been highlighted.

By measuring the business proposal in each of the segments, we identified differences between the three segments. Crop Protection Distributors would be able to develop and maintain a unique and customised business proposal to each of these segments based on their segment-specific needs and wants.

A new business proposal is a guarantee on claims made from recommendations (put your money where your mouth is) which was identified amongst all three segments. This is a new concept which does not form part of the current business models and business proposals submitted by Crop Protection Suppliers in South Africa.

Price Benchmarking and Market-related procurement price policies best describe the Mega-Sized Commercial and Medium and Large Sized Commercial Growers Segments, compared to customised (as negotiated) procurement price policy for Corporate Agri-Business. Crop Protection Distributors would be able to develop a pricing strategy per segment based on the results presented.

Respondents in each of the segments were asked which model they would prefer in the future to procure their Crop Protection Products. A new model was also suggested to be implemented in the Corporate Agri-Business segment where the product procured is split from the advice.

Based on the results, Crop Protection Distributors will be able to develop and maintain a segment-specific marketing mix.

Product:	Quality of product rated homogeneous amongst all three segments.
Price:	Pricing policy differentiation between each segment.
Place:	Channel: Different channels to be used in each of the segments, with the traditional model remaining unchanged in the Medium and Large Commercial Grower segment. The channels predominantly orientate towards the Crop Protection Distributor preference; however, future needs indicate a possible direct procurement through Crop Protection Manufacturers.

Promotion: Involvement of different role players in the promotion of the product in each of the segments. Section 5 also provided segment-specific needs about involvement frequency.

SRO 3: To determine whether the e-commerce business model should be adopted

The frequency based on the consideration to procure from an online platform is low amongst all three segments (below 40% of respondents), with the Mega-Sized Commercial Growers showing the greater appetite and the Corporate Agri-Business segment the least. The e-commerce model scored a low to very low relevancy amongst all three segments as a model for future procurement of Crop Protection Products.

It is suggested that this model should be investigated and researched more extensively before implementation.

Should this model be accepted and implemented in the future by Crop Protection Distributors, they should understand that the adoption thereof would represent a small portion of the total market size. Furthermore, if it is implemented, the purpose thereof, according to the respondents, is that it would be most relevant for:

- Price benchmarking
- Bargain hunting
- Transaction/product focus (looking for a specific product)
- Convenience

The research objective is met, and it is suggested that future research and rigorous investigation be done before this business model is implemented.

CHAPTER 4: CONCLUSION, IMPLICATIONS AND RECOMMENDATIONS

4.1 INTRODUCTION

Chapter 3 concluded to understand to what extent this study has addressed the secondary research objectives listed. By developing optimal segment-specific business models which should be implemented by Crop Protection Distributors in South Africa. This addresses the primary research objective of the study and also answers the primary research question. This final chapter also gives attention to the Research Propositions formulated. The Research Propositions follow the conceptual framework of literature study, analysis of the results, and conclusion to be considered towards the business model generation.

This chapter will propose the recommended segment-specific business models which should be implemented by InteliGro.

4.2 CONCLUSION AND IMPLICATIONS

4.2.1 Research Proposition 1 and Research Proposition 2

The Research Propositions supporting the deductive theory of the relationship between practice, theory and research for this study are:

Research Proposition 1: The needs and wants of each of the customer segments will differ based on the demographics, size, legalised structure, ownership %, profile, and crops cultivated.

Research Proposition 2: The buying decisions of Crop Protection Products for each of the customer segments differ.

4.2.1.1 Literature study

Successful businesses attribute market segmentation as a significant key to their marketing strategy. The importance of market segmentation is signified to the extent to which companies can tailor their marketing mix to a specific, well-defined market (Lamb *et al.*, 2019).

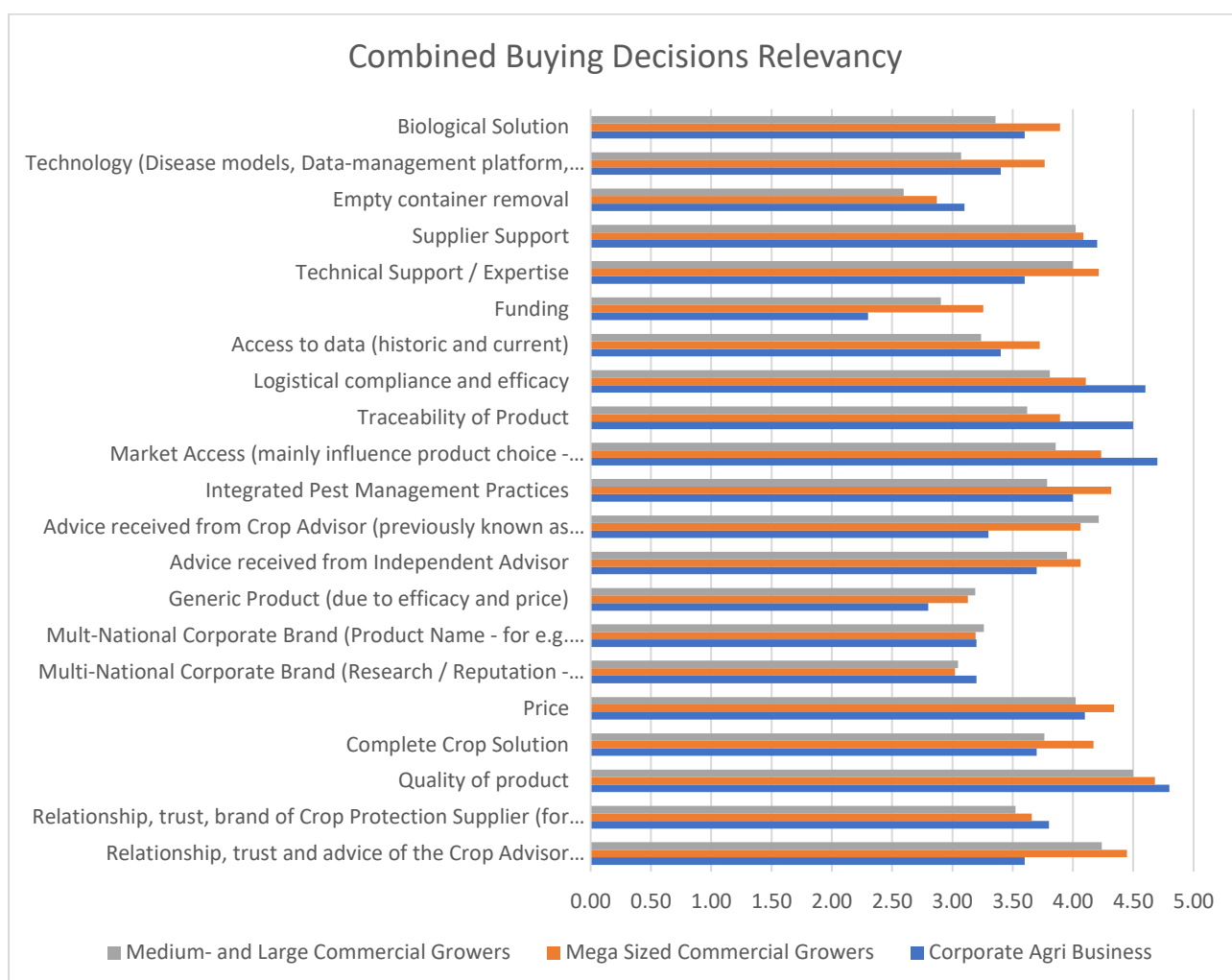
Some authors have viewed the consumer population as homogenous, with similar wants and needs while other authors have viewed the population as heterogeneous, where consumer preferences vary across socio-economic and demographic profiles (Macharia *et al.*, 2013).

There are three critical reasons why marketers segment markets. Firstly, it enables them to identify groups of customers based on similar needs, assists in the analysis of the characteristics of the customers and provides buying behavioural patterns. Secondly, the information obtained assists in the formulation of an appropriate segment-specific marketing strategy and mix. Thirdly, segmentation offers the opportunity to satisfy customer wants and needs while addressing the company's objectives (Lamb *et al.*, 2019).

4.2.1.2 Analysis of results

The analysis of the results will first and foremost aim to address Research Proposition 2, based on the buying decisions noted in Section 2 above, where the results in Section 1 will be combined with Section 2, in the quest to answer Research Proposition 1.

Figure 12: Combined decision-making relevancy per segment



The buying decisions of each of the segments are ranked below based on the results obtained in Question 17. The following factors for each of the segments were identified and ranked according to their importance based on their specific needs and wants. The ranking was based on the means scoring of each of the factors in each of the segments and listed only those above a mean of 4, which reflect “Strongly Agree” to “Essential”.

Corporate Agri-Business:

Factor	Mean	Priority
Quality of Product:	4.8	1 st
Market Access (Minimum Residue)	4.7	2 nd
Logistical Compliance and Efficiency	4.6	3 rd
Traceability of product	4.5	4 th
Supplier Support	4.2	5 th
Price	4.1	6 th
Integrated Pest Management Practices	4.0	7 th

Mega-Sized Commercial Growers

Factor	Mean	Priority
Quality of Product	4.68	1 st
Relationship, trust, and advice of the Crop Advisor	4.45	2 nd
Price	4.34	3 rd
Integrated Pest Management Practices	4.32	4 th
Market Access (Minimum Residue)	4.23	5 th
Technical Support / Expertise	4.21	6 th
Complete Crop Solution	4.17	7 th
Logistical Compliance and Efficiency	4.11	8 th
Supplier Support	4.09	9 th
Advice Received from Independent Advisor	4.06	10 th
Advice Received from Crop Advisor	4.06	11 th

Medium- and Large Commercial Growers

Factor	Mean	Priority
Quality of Product	4.50	1 st
Relationship, trust, and advice of Crop Advisor	4.24	2 nd
Advice received from Crop Advisor	4.21	3 rd
Supplier Support	4.02	4 th
Price	4.02	5 th
Technical Support / Expertise	4.00	6 th

Table 66: Summary of prioritised factors per segment (above mean of 4)

Corporate Agri-Business	Mega-Sized Commercial Growers	Medium- and Large Commercial Growers
Quality of Product	Quality of Product	Quality of Product
Market Access (Minimum Residue Levels)	Relationship, trust, and advice of Crop Advisor	Relationship, trust, and advice of Crop Advisor
Logistical Compliance and Efficiency	Price	Advice received from Crop Advisor
Traceability of product	Integrated Pest Management Practices	Supplier Support
Supplier Support	Market Access (Minimum Residue Levels)	Price
Price	Technical Support / Expertise	Technical Support / Expertise
Integrated Pest Management Practices	Complete Crop Solution	
	Logistical Compliance and Efficiency	
	Supplier Support	
	Advice received from Independent Advisor	
	Advice received from Crop Advisor	

It is clear from the information above that each segment has its own unique importance and relevancy in making their buying decisions when procuring Crop Protection Products.

In our conclusion of the results, we identified that SRO1 was achieved where the profile of each of the segments identified differ based on their description, profile, decision-making structure, ownership, crops cultivated, etc. – summarised below in each of the segments.

Table 67: Summary of segmentation questions

Category	CORPORATE AGRI-BUSINESS	MEGA-SIZED COMMERCIAL GROWERS	MEDIUM- & LARGE SIZED COMMERCIAL GROWERS
Description	Large scale farming with value chain integration. Corporate business structure.	Large scale farming with value chain integration. Management structure and strong owner involvement.	Medium & large-scale farming with no value chain integration. Majority of owner-managed units.
Market size	20 – 25%	15 – 20%	45 – 55%
CP Market Value	R2.0 Billion	R1.5 Billion	R4.5 Billion
Positional decision-makers	Managerial / Director level	Owner / Management	Owner / Management
Legalised structure	Company / Agricultural Businesses	Various	Various
Ownership structure	Majority 100% owned + external shareholding	Majority 100% owned - limited external shareholding	Majority 100% owned - limited external shareholding
External shareholding	Significant if applicable	Varies	Limited
Foreign shareholding	Varies	Limited	Limited
BBBEE shareholding	Varies	Limited & exploratory	Limited
Demographics	Multiple farms in different geographical regions, mainly in one province, although multiple provinces also applicable.	Operation mainly in one province, with limited extension to other provinces - exploratory to National.	Local, geographical area.
Crop cultivation	Diversified, multiple crops, majority irrigation and export orientation	Diversified, multiple crops, sustainable	Mainly one crop dimension. Diversification exploratory
Finance activities	Cash-rich, own funding majority & utilisation of financial institutions.	Less cash-rich, combination of own, financial institutions and Agricultural Business (VKB, Senwes).	Cash-tight, close relationship with Agricultural Business (VKB, Senwes) and Financial Institutions.
Crop Protection Channel purchases	Majority National Distributors, multiple channels, and partners	Majority National Distributors, limited other channels and partners	Mainly through one Crop Protection Supplier
Channel procurement preference	Crop Protection Supplier (less dependence on Crop Advisor)	Crop Protection Supplier (Main) and Crop Advisor (Support)	Crop Advisor (Main) and Crop Protection Supplier (Support)
Crop Protection purchases	> R10,0 MIO	<R10,0 MIO	R2,0 - R10,0 MIO
Scale	MEGA. OWN DECISION-MAKING, Less tender - no buying group.	LARGE TO MEGA, strong involvement by owner/managing director in decision-making, a higher trend towards tender and buying groups.	Average, own decision-making, less tender and buying group orientated.
Profile	Buying decisions typically made by managers/directors rather than owners. Business orientated & strong differentiation. Buy direct from Crop Protection Supplier - negotiation required.	Buying decisions typically made by owners/directors/management. Business Orientation, buying directly from Crop Protection Suppliers - the investigation into other channels - exploratory towards manufacturers and Agricultural Businesses.	Owner= Grower= Decision maker. Entrepreneurial, Innovative, Progressive & Diversification exploration. Relational focus on Crop Advisor and Crop Protection Supplier channels.

Question 19 addressed the business proposal requirements and needs per segment. Listed below is the summary of the business proposal importance where we listed those in each segment with a mean above 5 (“Most” to “Extreme” importance).

Table 68: Summary of Business Proposal Preferences per Segment

Corporate Agri-Business	Mega-Sized Commercial Growers	Medium- and Large Commercial Growers
Discount on Volumes	Discount on Volumes	Business Terms
Discount On Cash Payments	Business Terms	Discount on Volumes
Business Terms	Guarantee on Claims made from Recommendation	Discount on Cash Payments
Guarantee on Claims made from Recommendation	Discount on Cash Payments	Guarantee on Claims made from Recommendation
Bulk Container Purchases	Rebates	Rebates
	Bulk Container Purchases	
	Loyalty Programmes	

Similarities exist in the offer to each of the segments from a business proposal perspective. Differences exist in Bulk Container Purchasing preference in the Corporate Agri-Business segment, compared to the business proposal for rebates importance in the Mega-Sized Commercial Growers and Medium- and Large Commercial Growers Segments. An additional consideration is given in the Mega-Sized Commercial Growers, indicating that loyalty programmes would be the preference in this segment and should be included in the business proposal to each of these segments. It was interesting to note that funding initiatives and financial solutions had a high relevance in none of these segments, compared to traditional models noted in areas where summer row crops, oilseeds and winter cereals are cultivated.

Question 20 was formulated to determine which pricing policy implemented by each of the segments best describe how they make their decisions based on their pricing policy, and to test the Research Proposition whether there were any differences noted between these segments.

The results summarised below are based on a means above or close to 4, indicating that these segments agree with the pricing policy applied per segment.

Table 69: Summary of Pricing Policy Applied Per Segment

Corporate Agri-Business	Mega-Sized Commercial	Medium- and Large Commercial Growers
Customised (as negotiated)	Market-related	Market-related
Price Benchmarking	Price Benchmarking	Price Benchmarking

The results conclude that the Corporate Agri-Business would prefer a customised price policy as negotiated, where the other two sectors value market-related pricing policy. All three segments indicated that they would continue to value price benchmarking, which will influence their decision.

4.2.1.3 Conclusion

Research Proposition 1: The needs and wants of each of the customer segments will differ based on the demographics, size, legalised structure, ownership %, profile, and crops cultivated.

It can be concluded that the needs and wants of each of the customer segments will differ based on the demographics, size, legalised structure, ownership %, profile, and crops cultivated. This is represented by the information gathered in the segmentation (Section 1) results and by combining it with the results found in the buying decisions of Crop Protection Products preference identified. Concluding that both Research Proposition 1 and Research Proposition 2 was positively proved based on the sample population results.

Research Proposition 2: The buying decisions of Crop Protection Products for each of the customer segments differ.

Similarities did exist in the business proposal preferences in each of the segments, with minimal differences noted in the business proposal. The pricing policy implemented amongst the segments differs only for the Corporate Agri-Business segment, compared to the other two segments, with a robust additional focus on price benchmarking.

4.2.2 Research Proposition 3

The Research Proposition supporting the deductive theory of the relationship between practice, theory and research for this study is:

Research Proposition 3: The traditional business model will apply to a specific customer segment, medium to large size commercial producers.

4.2.2.1 Literature Study

We noted in the earlier literature study that the Crop Protection Industry is still dominated by Distributors and theirs to lose due to the level of trust and knowledge which still exist. Research is required to be updated in different channels and possibilities. Independent channel (seen in Distributors employing affiliated commission agents) performance is impacted by the trust. Olsson *et al.* (2013) has shown that despite increasing levels of disintermediation, distributors can obtain value from their business partners by adapting to changing market conditions.

The role of trust in various channels of distribution needs to be studied and understood, as it evolves in time and across different geographies and carries differing degrees of importance depending upon the cultural context in question (LaPlaca & Da Silva, 2016).

It is noted that the current business model in South Africa remains relevant, as seen by the minor increase in Distributors and a significant increase in Independent Affiliated Commissioned Agents. It would be assumed that this model would continue to be relevant to a specific segment for the near future. Research conducted in 2016, B2B: A paradigm shift from Economic Exchange to Behavioural Theory: a quest for better explanations and predictions, indicated that a great majority of B2B firms reach their customers through various channels of distribution. ***These channels are constantly evolving.***

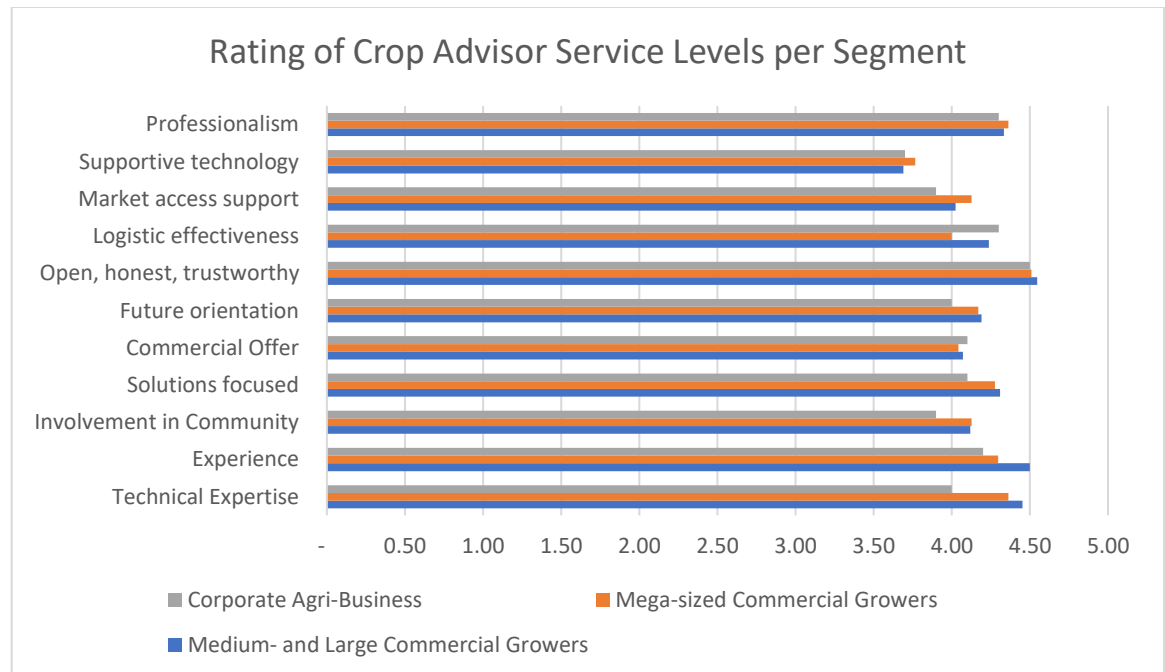
Value innovation was defined by Chan Kim and Mauborgne in 1997 as companies who do not focus on beating or matching their rivals. Instead, through employing a strategic logic, they aimed to make their competitors irrelevant (Chan Kim & Mauborgne, 1997). These companies focused on getting out of the existing market boundaries (“red-ocean”) through the creation of significant value to their customers which kept them ahead of their competitors (Chan Kim & Mauborgne, 2005b).

To determine whether the current business model implemented has a certain level of relevancy in a specific segment, we have to understand whether that segment sees the current business model as creating value for them as growers.

4.2.2.2 Analysis of results

We draw our attention now to the rating of service received from their Crop Advisor to understand the level of trust, knowledge, experience, technical expertise and overall, for the Medium- and Large-sized Commercial Growers Segment (blue bar), compared to the other two segments.

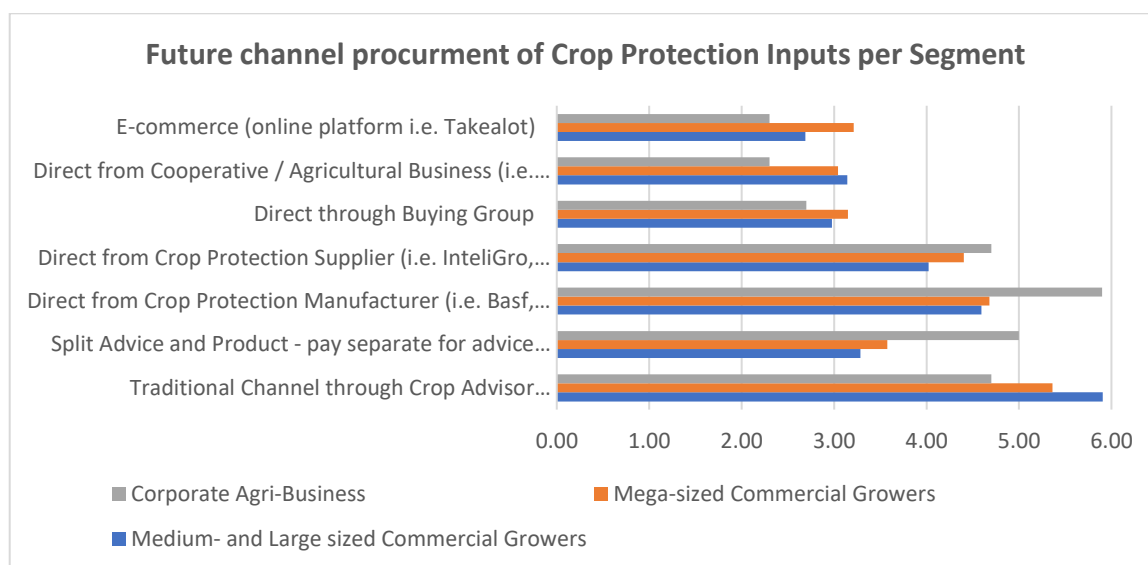
Figure 13: Rating of crop advisor service levels per segment



Scoring of a mean of 4 and above presents “Good” (4) to “Excellent” (5). It is clear that the Medium- and Large Commercial Growers Segment (blue bar above) rated their Crop Advisors the highest (“Excellent”) in the open, honest, trustworthy, experience, and technical expertise. An overall had an average mean of 4.23, which was the highest amongst all three segments. We conclude that the level of trust and knowledge in this sector, primarily from the Crop Advisor, is high.

We now refer to the models in each segment which they would see to continue to exist in the future when deciding to purchase Crop Protection Inputs.

Figure 14: Future channel of procurement of Crop Protection Inputs per segment (Preference)



Based on the figure above, the most relevant channel of choice for the Medium- and Large sized Commercial growers to procure their Crop Protection Inputs would be through the Crop Advisor – a traditional channel, compared to the Corporate Agri-Business segment choice of direct from Crop Protection Manufacturer.

We note that the Mega-Sized Commercial Growers' choice is a traditional channel. However, there are strong means towards direct from Crop Protection Manufacturers and Crop Protection Supplier as a future model. When one compares it to the mean scoring in the level of trust, brand, reputation, and relationship of Crop Protection Supplier (e.g. IntelliGro) in their factors impacting their decision in procuring Crop Protection Inputs, we would suggest that the negotiation and the primary relationship will be direct with Crop Protection Supplier (i.e. IntelliGro) and link up with service from Crop Advisor.

4.2.2.3 Conclusion

The results indicate that the Medium- and Large Commercial Grower Segment has the highest level of trust and knowledge in the traditional channel (through their Crop Advisor). They further indicated that they would continue in the future to procure their Crop Protection Inputs through this channel, compared to the other segments. The traditional channel and business model (although required to be tweaked concerning the business proposal) would be the choice for the Medium- and Large Commercial Growers Segment.

4.2.3 Research Proposition 4

The Research Proposition supporting the deductive theory of the relationship between practice, theory and research for this study is:

Research Proposition 4:	Research data, technology and industry-related information, play a significant role in the buying decision-making processes in certain customer segments and are of lesser importance in other customer segments.
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4.2.3.1 Literature Study

The Fourth Industrial Revolution (4IR) has been characterised by the fusion of the digital, biological, and physical world. There is a growing acceptance and utilisation of Artificial Intelligence, cloud computing, robotics, Blockchain, and Internet of Things, among others.

The 4IR is now an inescapable reality which promises to benefit us all, not only from a technological perspective, but also regarding aspects which include energy, environment, economics, policy, consumer, and social changes as active drivers of a definite future towards change (Ungerer *et al.*, 2018).

The agriculture sector is set to benefit from the 4IR, to enable the agricultural sector to transform into an “Agri-Renaissance”. Technology which will benefit growers includes farm-management software, precision agriculture, predictive data analytics, and predictive gene analytics. Growers will be able to monitor the health of their crops, as well as the weather and their soil quality using robotics and drones. All these technologies are developed to enable the growers to increase their yields, reduce their costs and improve the nutritional value of the food they produce (Ungerer *et al.*, 2018).

The COVID pandemic has also taught the world to look increasingly different at the adoption of technology where Virtual Field Days and Virtual Conferences can be held without the prior models of face-to-face field days and conferences. Especially Crop Protection Distributors need to think differently about how they will differentiate their solution in an ever-changing, technology-adapted world with positive appetite.

4.2.3.2 Analysis of results

Figure 1.15 refers to the importance of each of the segments with specific reference to technology (i.e., disease forecasting models, electronic monitoring) in their decision-making towards procurement of Crop Protection Inputs. The mean scoring was out of 7, where 7 represents “Extremely important”. The results indicate that for the Corporate Agri-Business segment, this section and service offering is extremely important to their decision-making, followed by the Mega-Sized Commercial Growers and of less importance to the Medium- and Large Commercial Growers.

Figure 1.16 reflects the importance of each type of information available per segment. The mean scoring was out of 7, where 7 represents “Extremely important”. The information pattern follows that of technology, where the Corporate Agri-Business segment rated this information as “very important” to “Extremely important” in their decision-making process and solution offering.

4.2.3.3 Conclusion

The business model for the Corporate Agri-Business segment should include technology and information as of the value proposition to this segment to be adopted by Crop Protection Distributors. Mega-Sized Commercial Growers should also include an element towards technology and information as part of their value proposition, however, it would be advised that this would be customised in accordance to the specific need of that grower.

Figure 15: Technology level of importance per segment

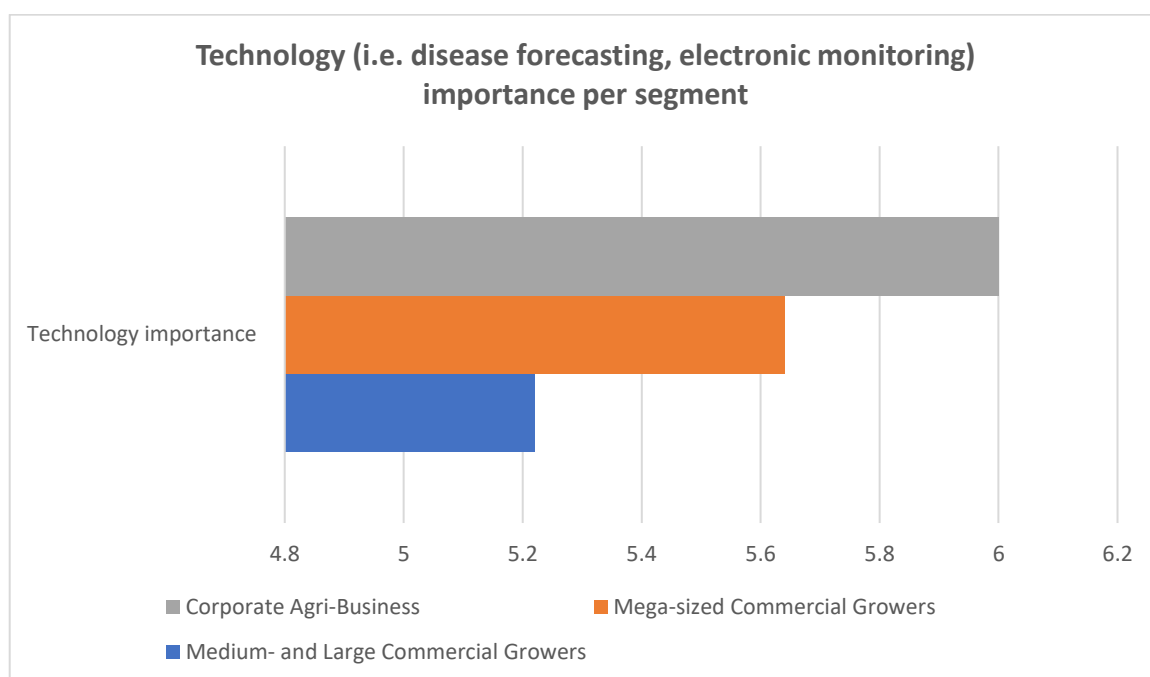
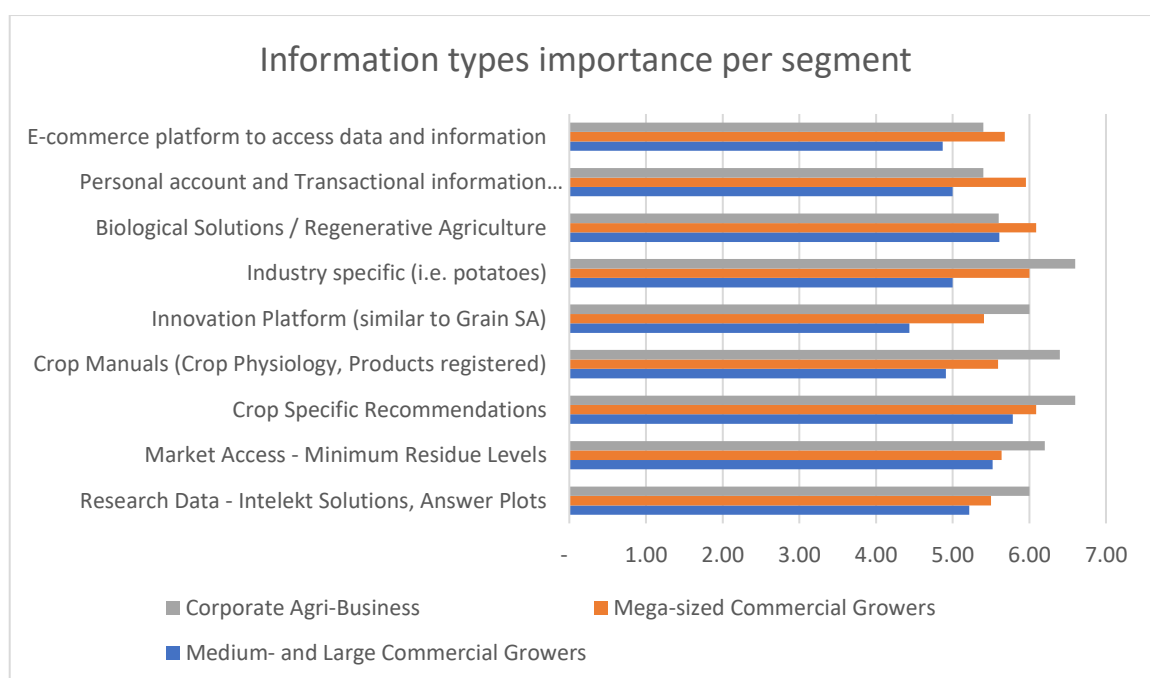


Figure 16: Information per type level of importance per segment



4.2.4 Research Proposition 5

The Research Proposition supporting the deductive theory of the relationship between practice, theory and research for this study is:

Research Proposition 5:	An e-commerce business model should be implemented by Crop Protection Distribution Companies.
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4.2.4.1 Literature Study

It was noted in Chapter 1 that new start-ups have popped up, such as Farm Trade and Farmers Business Network (FBN), where these companies sell products directly to growers at a set cost via an e-commerce model. The business model has taken the space of approximately 15% to 20% of a specific market segment where growers focused on the lowest-cost provider (Sfiligoj, 2017).

It is assessed that the Amazon-type e-commerce model could occupy at least 10% of the total market penetration and might fail on a large scale due to the demographics of the market and its segments. It is further argued that this model might fail on a large scale as Crop Protection Distributors still have an amount of knowledge and trust in agriculture which will be required from growers.

Multiple Agricultural input suppliers and role players are building their network with farmers, whether it's through loyalty or access through digital platforms or marketplace access (Seraphim, 2020a). In the journal article *E-commerce in agriculture – The case of Crop Protection product purchases in a discrete choice experiment*, (Fecke et al., 2018) indicated that there are several factors influencing e-commerce activities, namely:

- Price in e-commerce: where it was found that growers are willing to buy on an e-commerce platform should there be a significantly lower price.
- Trust in e-commerce: as a significant contributor to the willingness to buy on an e-commerce platform, the trust in the channel and the supplier from the e-commerce plays a significant role whether growers will buy from the e-commerce site or not. We identified earlier that there is still a significant level of trust and knowledge in the Crop Protection Distributor level, which will have a direct impact on the willingness of the grower to go the e-commerce way.

- Service quality in e-commerce: it was noted that in line with trust, the agricultural sector prefers personal consultation and interaction, which reduces their appetite towards e-commerce.
- Delivery time in e-commerce: was noted as a significant factor, especially regarding machine parts. It was Research Propositioned that, should delivery time be improved and shortened, the willingness to accept the e-commerce model would increase.
- Risk aversion of consumers and e-commerce: the study indicated that the risk aversion of each consumer or grower has a direct impact on the willingness to buy on an e-commerce platform.
- Prior experience with e-commerce: has a direct link in agriculture towards a willingness to buy on an e-commerce platform, based on prior experience (good or bad) (Fecke *et al.*, 2018).

In a *Croplife 100 survey* dated back in 2017, respondents indicated that e-commerce was a major threat to the Crop Protection Distribution Industry. However, in the 2019 *Croplife 100 survey*, 78% of the respondents indicated that it was a minor threat (Sfiligoj, 2020).

The report further states that the threat has subsided significantly because Crop Protection Distributors have embraced the concept itself, with the launch of platforms like CommoditAg. The success remains according to the report that Crop Protection Distributors accessed the form of trust and knowledge (some of the concerns noted above) and created the platform themselves with the sound recommendation, reputation, brand and trust to mitigate the risk (Sfiligoj, 2020).

4.2.4.2 Analysis of results

Our analysis of the results supports our earlier assessment that the e-commerce space in the market will not have a significant role, and although minimal, will only apply to a certain segment or certain needs and wants of a grower at a specific time or period.

Table 70: E-Commerce option (Yes / No)

	Corporate Agri-Business		Mega-Sized Commercial Growers		Medium- and Large Commercial Growers	
	Yes	No	Yes	No	Yes	No
Frequency	3.0	9.0	18.0	29.0	18.0	30.0
Per cent	25.0	75.0	38.3	61.7	37.5	62.5

The above table presented the range of the segments in which we identified that between 25% to 38% of respondents would consider procuring products using an e-commerce platform. We also requested the respondents to provide us with the primary reasons why they would use such a platform to procure Crop Protection Inputs.

Table 71: Segment-specific primary reasons for procuring crop protection products through e-commerce model

	Corporate Agri-Business			Mega-Sized Commercial Growers			Medium- and Large-sized Commercial growers		
	Mean	Standard Deviation	Rank	Mean	Standard Deviation	Rank	Mean	Standard Deviation	Rank
Bargain-hunting	3.60	2.63	3.00	3.70	2.61	2.00	3.29	2.55	3.00
Transaction (product focus)	4.00	2.36	2.00	3.65	2.57	4.00	3.51	2.33	2.00
Benchmarking	4.10	2.38	1.00	4.11	2.65	1.00	3.83	2.57	1.00
Convenience	3.40	2.17	4.00	3.67	2.58	3.00	3.22	2.34	4.00
Current channel / model not optimal	1.90	1.10	6.00	2.64	2.14	6.00	2.39	1.91	6.00
Other value chain activities (i.e. insurance, technology, seed, fertilizer)	2.70	2.06	5.00	3.00	2.27	5.00	2.88	2.03	5.00

The results above for all the questions from a means are all low compared to the most relevant scoring means of 7. Should this model be accepted and implemented in the future by Crop Protection Distributors, the purpose thereof, according to the respondents (all three segments agree), is that it would be most relevant and ranked below:

- Price benchmarking (price in e-commerce)
- Bargain hunting (price in e-commerce)
- Transaction/product focus (price in e-commerce)
- Convenience (delivery and service in e-commerce)

4.2.4.3 Conclusion

In a whitepaper published by (ProAgrica, 2020b), *Engaging growers to Demonstrate Value*, the whitepaper paints a picture that growers' preference is changing rapidly and that the e-commerce model might be a phase in an ideal scenario. However, they continue to present the case that growers are not seeking from their "trusted advisor" and suppliers a seamless end-to-end solution of product research, advice, discovery and purchase.

Crop Protection Distributors who are willing to embrace digital tools, which are driven and backed by sound agronomic and product knowledge, fostering the strength of their existing trust relationships, and honing on local expertise, should see the application of digital tools as the opportunity of a generation.

It would be suggested that Crop Protection Distributors (with specific reference to IntelliGro) should create an integrated, end-to-end data exchange and interaction platform with growers which present the characteristics of online shopping. Furthermore, including good engagement, a “banking system with a history of transactions”, access to their agronomic data, product data, account balances, and payment records, to enable the grower to experience a virtual contact with the Crop Protection Distributor. A platform with these characteristics should address the concerns noted above in the journal article by (Fecke *et al.*, 2018).

Research Proposition 5 is partially proven, where the e-commerce platform should not necessarily only create an environment of buying online but should include the characteristics above.

4.2.5 Research Proposition 6

The Research Proposition supporting the deductive theory of the relationship between practice, theory and research for this study is:

Research Proposition 6:	The business models will differ per customer segment based on the needs and wants of each of the customer segments.
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4.2.5.1 Literature Study

Our literature study revealed that numerous challenges exist in relation to agriculture, growers, the Crop Protection Industry and Crop Protection Distributors.

The theme of sustainability, adaptability, value innovation, technology and efficiency amidst the challenges pulls a golden thread through the study to address food security in an environmentally conscious, friendly and responsible manner.

In a VUCA (Volatile, Uncertain, Complex, Ambiguous) world, quoting Darwin, only the smallest, most agile and most adaptable to change will be those who survive.

The profile of the consumer is ever-changing, and so the grower will be ever-changing to address those specific needs. In that context, all input suppliers and especially Crop Protection Distributors need to change to meet those needs and wants.

4.2.5.2 Analysis of results

Our results have identified, and the Research Propositions proved that:

- The needs and wants of each of the grower segments, namely Corporate Agri-Business, Mega-Sized Commercial Growers and Medium- and Large-sized Commercial growers differ based on the demographics, size, legalised structure, ownership % and crops cultivated.
- The buying decision of Crop Protection Products and the main factors which influence their decisions will rank differently based on priority per segment.
- The traditional business model will only apply to some extent to the Medium- and Large Commercial Growers Segment and that work needs to be done on the Commercial offering and business proposal in this segment.
- Research data, technology and industry information play a significant role in the Corporate Agri-Business segment, and to a lesser extent, although still with some applicability towards the Mega-Sized Commercial Growers.
- The e-commerce business model should be revisited to include a fully integrated end-to-end data platform which can be implemented.

4.2.5.3 Conclusion

In conclusion, based on the Research Propositions proved above, that specific business models should be developed for each grower segment based on that segments' particular needs and wants.

4.3 RECOMMENDATIONS

We have arrived at the conclusion that optimal business models should be developed that are segment-specific based on the segment's specific needs and wants. These business models will be required to be implemented by Crop Protection Distributors (more specifically IntelliGro) to remain relevant in creating value for each of these segments.

The business models for each of the segments, comparing it with the current business model as a basis for InteliGro, will be presented per segment in the table below and combined with the Omni-channel marketing recommendation.

4.3.1 Omni-channel marketing

How Crop Protection Distributors engage with their growers in the future will depend to which extent the Crop Protection Distributor will remain sustainable and relevant in the future. Crop Protection Distributors need to show their value to growers as we have seen in the study above. Multiple segments require different business proposals and the decision to buy from a Crop Protection Distributor will depend on how they can address those specific needs and wants. Crop Protection Distributors in the past (traditional business model) engaged their growers primarily through the Crop Advisor, and possible disparity or bias could have been formed as to the actual needs and wants of each of those grower segments. It is noteworthy that the channels/growers continuously evolve.

It is recommended that InteliGro implement an Omni-channel marketing system, where growers will be able to move through various channels of specific business proposals, pricing policy, access to technology, information, factors impacting their decisions, agronomic data, and service levels they require from whom, at any stage. The integration of data (history, current) on one platform is crucial and an unavoidable prerequisite in the future, from a CRM to inventory, to agronomic data to pricing (ProAgrica, 2020b).

4.3.2 Omni-channel defined

It refers to a cross-channel content strategy which creates an improved customer experience at each channel, and through this drive improve customer relationships. Channels refer to traditional (physical) and digital (Becker, 2016). In the case of InteliGro, these channels will be the grower segments as defined.

4.3.3 Omni-channel Marketing Definition:

It refers to a multi-channel sales approach, where each channel works together to create an integrated, interdependent, and consistent brand experience. The goal is for the customer to have a seamless experience when shopping, whether it's online, mobile, brick-and-mortar, inspections or physical visits (Becker, 2016). The strategy acknowledges that the grower has ready access to information.

- The objective of creating an Omni-channel marketing strategy is to develop grower segment-specific business models and solutions offering to ensure **direct market access, increased market share, increased grower satisfaction and to counter anticipated competitor strategies.**
- The Omni-channel focuses on the customer-first and the segment-specific models, which will be developed based on the specific grower's needs and wants.

The Omni-channel marketing per segment is presented in the table below, summarised per segment based on the study (which integrates all the data gathered during the study).

Table 72: Omni-channel marketing: per segment based on the study results

Category	CORPORATE AGRI-BUSINESSES	MEGA-SIZED COMMERCIAL GROWERS	MEDIUM- & LARGE SIZED COMMERCIAL GROWERS
Description	Large scale farming with value chain integration. Corporate business structure.	Large scale farming with value chain integration. Management structure and strong owner involvement.	Medium- & large-scale farming with no value chain integration. Majority of owner-managed units.
Positional decision-makers	Managerial / Director level	Owner / Management	Owner / Management
Legalised structure	Company / Agricultural Businesses	Various	Various
Ownership structure	Majority 100% owned + external shareholding	Majority 100% owned - limited external shareholding	Majority 100% owned - limited external shareholding
External shareholding	Significant if applicable	Varies	Limited
Foreign shareholding	Varies	Limited	Limited
BBBEE shareholding	Varies	Limited & exploratory	Limited
Demographics	Multiple farms in different geographical regions, mainly in one province, although multiple provinces also applicable.	Operation mainly in one province, with limited extension to other provinces - exploratory to National.	Local, geographical area.
Crop cultivation	Diversified, multiple crops, majority irrigation and export orientation	Diversified, multiple crops, sustainable	Mainly one crop dimensional, Diversification exploratory
Finance activities	Cash-rich, own funding majority & utilisation of financial institutions.	Less cash-rich, combination of own, financial institutions and Agricultural Business (VKB, Senwes).	Cash-tight, close relationship with Agricultural Business (VKB, Senwes) and Financial Institutions.
Crop Protection Channel purchases	Majority National Distributors, multiple channels and partners	Majority National Distributors, limited other channels and partners	Mainly through one Crop Protection Supplier
Channel procurement preference	Crop Protection Supplier (less dependence on Crop Advisor)	Crop Protection Supplier (Main) and Crop Advisor (Support)	Crop Advisor (Main) and Crop Protection Supplier (Support)
Crop Protection purchases	> R10,0 MIO	<R10,0 MIO	R2,0 - R10,0 MIO
Scale	MEGA. OWN DECISION-MAKING, Less tender - no buying group.	LARGE TO MEGA, strong involvement by owner/managing director in decision-making, the higher trend towards tender and buying groups.	Average, own decision-making, less tender and buying group orientated.
Profile	Buying decisions typically made by managers/directors rather than owners. Business orientated & strong differentiation. Buy direct from Crop Protection Supplier - negotiation required.	Buying decisions typically made by owners/directors/management. Business Orientation, buying directly from Crop Protection Suppliers - an investigation into other channels - exploratory towards manufacturers and Agricultural Businesses.	Owner= Grower= Decision maker. Entrepreneurial, Innovative, Progressive & Diversification exploration. Relational focus on Crop Advisor and Crop Protection Supplier channels.

Category	CORPORATE AGRI-BUSINESSES	MEGA-SIZED COMMERCIAL GROWERS	MEDIUM- & LARGE SIZED COMMERCIAL GROWERS
Main factors for impacting buying decisions	Quality Product	Quality product	Quality Product
	Market Access Support	Relationship, trust and advice of Crop Advisor	Relationship, trust and advice of Crop Advisor
	Logistical efficiency / Bulk	Price	Price
	Traceability of product	Market Access Support	Technical Support / Expertise
	Supplier Support	Technical Support / Expertise	Advice received from Independent Advisor
	Price	Logistical efficiency / Bulk	Market Access Support
	Integrated Pest Management	Supplier Support	Logistical efficiency / Bulk
	Relationship, trust, the brand of Crop Protection Supplier	Biological Solutions	Complete Crop Solution
	Advice received from Independent Advisor	Traceability of Product	Relationship, trust, the brand of Crop Protection Supplier
	Complete Crop Solution	Technology (i.e. Disease Forecasting)	Biological Solutions
Service	Crop Advisor - logistics - ad-hoc	Crop Advisor - Weekly	Crop Advisor - Weekly
	Crop Specialist - Weekly	Crop Specialist - Monthly	Crop Specialist - monthly
	Technical Advisors/consultants - weekly	Technical Advisors / Consultants - Monthly	Technical Advisors / Consultants - Ad-hoc
	Key Account Managers - Monthly	Key Account Managers - Annually	Key Account Managers - Annually/Ad-hoc
PRICE POLICY	Customised Solution	Market-Related	Market-Related & price benchmarking
	Price Benchmarking	Price Benchmarking	Price Benchmarking
BUSINESS PROPOSAL	Discount on Volumes	Discount on Volumes	Business Terms
	Discount on Cash Payments	Business Terms	Discount on Volumes
	Business Terms	Guarantee on Claims Made from Recommendation	Discount on Cash Payments
	Guarantee on Claims Made from Recommendation	Rebates	Guarantee on Claims Made from Recommendation
	Bulk Container Purchases	Bulk Container Purchases	Rebates
		Loyalty Programmes	

Category	CORPORATE AGRI-BUSINESSES	MEGA-SIZED COMMERCIAL GROWERS	MEDIUM- & LARGE SIZED COMMERCIAL GROWERS
Technology	EXTREMELY IMPORTANT	IMPORTANT	SOMEWHAT IMPORTANT
Channel	Crop Protection Supplier + Independent / Technical	Crop Protection Supplier + Crop Advisor	Crop Advisor + Crop Protection Supplier
Information (as per priority)	Crop Specific Recommendations	Crop Specific Recommendations	Crop Specific Recommendations
	Industry-specific (i.e. potatoes)	Biological Solutions / Regenerative Agriculture	Biological Solutions / Regenerative Agriculture
	Crop Manuals (Crop Physiology, Products registered)	Industry-specific (i.e. potatoes)	Market Access - Minimum Residue Levels
	Market Access - Minimum Residue Levels	Personal account and Transactional information platform (current and history)	Research Data - Intellect Solutions, Answer Plots
	Research Data - Intellect Solutions, Answer Plots	E-commerce platform to access data and information	Industry-specific (i.e. potatoes)
Loyalty programs			
Internal - sharing goodness	NO	YES	YES
Suppliers – rebates	NO	YES	YES

4.3.4 Value innovation

We highlighted in the literature study the importance of value innovation and latest updated Blue Ocean Strategy for Crop Protection Distributors to address their major threat of profitability. The value gap exists in the current Red-Ocean Strategy, where services and products from Crop Protection Distributors, as well as the marketing strategy/business model to growers, are perceived as commoditised.

Crop Protection Distributors need to demonstrate value on grower level to address the value gap (moving from the current Red Ocean Strategy moving towards Blue Ocean Strategy). The Blue Ocean represents value innovation and includes all those factors to differentiate one Crop Protection Distributor from the Red Ocean competitor.

The Omni-channel marketing approach to be adopted by IntelliGro is one of the differentiating factors and Blue Ocean Strategy tools to be implemented. We continue to propose the following for consideration to be implemented by IntelliGro as additional differentiating factors (Seraphim, 2020b):

Table 73: Phase 1: Value innovation: services implementation

Service	Description
Technical Assistance	Crop Inputs: Highly technical and requires proper recommendations Output: Invest in the technical team to have the best professionals; some companies charge for technical assistance provided while distributors give it for free.
Product Delivery Logistics	Input: Grower wants the product in good condition and available at the right time Output: Capture synergies with growers – seen in the results – bulk/logistics is an offering expected by growers, more so in the Corporate Agri-Business segment, but also present in the other segments.
Precision Agriculture	Input: Product and recommendation combined Output: Regulation and precision of crop inputs application. Use these tools to drive operational efficiency and assertiveness in recommendations. These services are disconnected from the offer of products. These tools need to be used for an improved offer/recommendation.
Crop Insurance	Input: Climate change and adverse factors Output: Collaboration with crop insurance companies to provide an offer combined with own Product/Solution offering.
Weather Stations	Input: Access to data Output: Sale of information (not equipment) and connecting information between Distributor and Grower to mitigate risk and capture value.

The above services, presented as Phase 1, are advised to be implemented as Priority 1, within the next 12 months to capture value innovation.

The next phase can be considered by IntelliGro within the following 12 to 36 months.
Services to be implemented:

Table 74: Phase 2: Value innovation: services implementation

Service	Description
Soil and tissue sampling and labs	Input: Understanding the behaviour of soil and leaves Output: Collaboration with companies to provide these services combined with IntelliGro Crop Solutions.
Custom application	Input: Farmers prefer owning their traditional equipment Output: Collaboration with aerial applications/drones to improve efficacy.
Administrative and financial management tools	Input: Information available at Distributor level of transactions and history of grower Output: Providing this data and access to growers on an online platform – see how reliant we are on our Banks for this information.
Commercialisation services	Input: Grower needs access to market – see the role of Cooperatives Output: Distributors' involvement to assist growers with selection, classification, standardisation, and commercialisation of their products.
Marketplace	Create an Integrated, end-to-end data exchange and interaction platform with growers which presents the characteristics of online shopping, good engagement, a “banking system with a history of transactions”, access to their agronomic data, product data, account balances, and payment records. Enabling the grower to experience virtual contact with the Crop Protection Distributor. A platform with these characteristics should address the concerns noted above in the journal article by (Fecke <i>et al.</i> , 2018).
Intelligent irrigation	Input: Management of water resources is crucial for the sustainability of our planet and growers Output: Collaboration with selected suppliers as an integral part of Complete Crop Solution.
Services for certification, traceability, and sale of carbon credits	Input: Opportunistic market opportunities to address consumer demand for safer, more transparent, traceable, greener products Output: Traceability of product for two of the segments were of critical importance; develop a tool that demonstrates product traceability and production sustainability.
Sensors and Instruments for predictive analysis	Input: Tools required to increase productivity, risk mitigation and increase sustainable efficiency Output: Collaboration with selected suppliers as an integral part of Crop Solution Offering.

4.4 LIMITATIONS OF THE STUDY

Research in its nature is not faultless and has its limitations, as well as suggestions which will be required to be made. These aspects should be examined to determine their possible influence on the results presented (Burns & Bush, 2014). The limitation of the empirical study is presented below.

Demarcation of study: This study only focused on the business model for InteliGro-specific growers in their database and did not include all growers in South Africa.

4.5 AREAS FOR FUTURE RESEARCH

We noted above that the study is limited only to the responses received from growers within InteliGro specifically, and that future studies should extend to the rest of South Africa. Although we do view that the responses on the needs and wants fairly present the views of the majority segments, some additional information might become available.

Other segments, such as Cooperative Purchases and buying groups, were not covered during this study. It is recommended that a survey of the needs and wants of those segments continue in the future to develop business models for Crop Protection Distributors in those segments.

We conclude that these are only proposed business models to be implemented. Future research would be required to determine whether these specific business models per segment was successful or not.

4.6 SUMMARY

The study aimed to develop segment-specific business models for Crop Protection Distributors in South Africa. The results concluded that each grower segment has a different profile, and based on that specific profile, their needs and wants concerning factors impacting their buying decision, rating of services provided, the importance of access to technology and detailed information and possible future channels in the procurement of Crop Protection Inputs differ.

The study was able to propose segment-specific business models for the Corporate Agri-Business, Mega-Sized Commercial Grower and Medium- and Large-sized Commercial Grower segments based on their specific needs and wants. These business models were presented in a comprehensive Omni-channel marketing strategy which should be adopted by InteliGro.

The study also concluded that, should a Crop Protection Distributor consider developing an e-commerce platform to sell its products, it would be suggested that Crop Protection Distributors (with specific reference to InteliGro) should rather create an integrated, end-to-end data exchange and interaction platform with growers. Additionally, the platform should present the characteristics of online shopping, good engagement, a “banking system with a history of transactions”, access to their agronomic data, product data, account balances, and payment records, to enable the grower to experience a virtual contact with the Crop Protection Distributor. A platform with these characteristics should address the concerns noted above in the journal article by (Fecke *et al.*, 2018).

The study concluded in its final recommendation to InteliGro which services should be considered to be investigated and implemented in two phases (Phase 1 focusing on the next 12 months, and Phase 2 focusing on the next 12 to 36 months). We believe that the recommendations would create a value innovation (Blue Ocean) Strategy for InteliGro to address the threat of its profitability and to create an environment of uncontested differentiation.

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APPENDICES

APPENDIX A: ETHICS APPROVAL



NORTH-WEST UNIVERSITY
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Economic and Management Sciences Research
Ethics Committee (EMS-REC)

14 September 2020

Prof Christo Bisschoff
Per e-mail
Dear Prof Bisschoff

EMS-REC FEEDBACK: 29052020
Student: Nienaber, PJ (33483132)(NWU-00675-20-A4)
Applicant: Prof C Bisschoff - MBA

Your ethics application on, *Developing segment-specific business models for agricultural crop protection distributors in South Africa*, which served on the EMS-REC meeting of 29 May 2020, refers.

Outcome:

Approved as a minimal risk study. A number NWU-00675-20-A4 is given for one year of ethics clearance.

Due to the Covid-19 lock down ethics clearance for applications that involve data collection or any form of contact with participants are subject to the restrictions of the South African government.

Kind regards,

Mark
Rathbone

Digitally signed by Mark Rathbone
DN: cn=Mark Rathbone, ou=North-
West University, ou=Business
management,
email=mark.rathbone@nwu.ac.za,
c=ZA
Date: 2020.09.16 11:00:00 +02'00'

Prof Mark Rathbone
Chairperson: Economic and Management Sciences Research Ethics Committee (EMS-REC)

APPENDIX B: LETTER OF CONSENT: ACCESS TO DATABASE



Wellington: Tel: +27 21 873 6177 | Viljoenskroon: Tel: +27 56 343 3444 | info@inteligro.co.za | www.inteligro.co.za

22 April 2020

NWU Business School
Private Bag X1290
POTCHEFSTROOM
2520

Dear Prof. C. Bisschoff

This letter serves as confirmation that InteliGro is aware of the research study of student PJ Nienaber (Student nr: 334 831 32) with the research title: **DEVELOPING OPTIMAL BUSINESS MODELS CHALLENGING CROP PROTECTION DISTRIBUTORS IN A CHANGING AGRICULTURAL LANDSCAPE** and that we have read his proposal submitted in partial fulfilment of the requirements for the degree Master's in Business Administration (MBA) to the ethics committee.

The studies and the research are funded in full by InteliGro (Pty) Ltd and InteliChem (Pty) Ltd (Majority shareholder of InteliGro) has been involved in an advisory capacity in this study (represented by Mr R Geldenhuys: Director: Business Development). We therefore grant access to Mr PJ Nienaber to access the database of clients of InteliGro (Pty) Ltd in order to select a sample of participants to the study.

If you have any questions, please do not hesitate to contact the writer here-of.

Regards

JvB Hanekom
Managing Director



WELLINGTON: 3 Marchand Street, Wellington, 7655 | PO Box 85, Wellington, 7654, South Africa
VILJOENSKROON: 17 Fortuna Street, Viljoenskroon, 9520 | PO Box 446, Viljoenskroon, 9520, South Africa
Directors: JS du Plessis, F Fivaz, R Geldenhuys, JvB Hanekom, GD Hefer, DHM Kruger, E Myburgh, PJ Nienaber, W Theron, PV Wium
Company Registration Number: 1995/004580/07 | Subsidiary of InteliChem (Pty) Ltd | Registered Address: Kathrein Wine Estate, Annandale Road, Lynedoch, 7603

APPENDIX C: QUESTIONNAIRE

NWU MBA Research - Developing optimal segment-specific business models for agricultural crop protection distributors in South Africa

Informed Consent

Dear Participant

You are hereby invited to take part in a research study that forms part of my Masters of Business Administration. Please take some time to read the information as indicated below, which will explain the details of this study.

What is this research study all about?

Research Title: Developing optimal segment-specific business models for Crop Protection Distributors in South Africa.

a) The research will be conducted to assess the effectiveness of the current business models employed by Distributors of Crop Protection Products in South Africa; and

b) The research aims to determine the specific requirements and/or needs of you as a commercial producer;

What will be expected of you?

a) You will be required to answer the questions as per the questionnaire. You are under no obligation to answer questions that you are not willing to answer. The questionnaire will not take longer than 15 MINUTES to complete.

b) The questionnaire is divided into 3 sections:

- Section 1: Information and segment-specific questions (9 Questions)
- Section 2: Factors impacting your decision when procuring Agricultural Crop Protection Products (13 Questions)
- Section 3: Other decisions / supplementary information (5 Questions)

It is important for you to know that the following will apply should you agree to participate:

- It is voluntary, and you are free to refuse to partake or withdraw from the study at any stage without any consequences.
- You will have to complete an online questionnaire on Survey Monkey consisting of three sections that should take approximately 15 minutes of your time.
- You will be anonymous at all times, and confidentiality is guaranteed.
- This study does not create any physical risk to you or anyone else, as this study does not involve any physical activities or experimentations. The nature or process of collecting the data from the questionnaires does not constitute a risk to you or any other party.
- Data collected will be regarded as confidential and will not be shared with any third party that is not directly involved in this research study. The data will be used for research purposes only.

- The final results following the completion of this study will be available in a mini-dissertation on the NWU library system.

You are welcome to contact the researcher or supervisor, indicated in the table below if you need clarification.

	Researcher	Supervisor
Title:	Mr.	Prof.
Name:	Johan	Christo
Surname:	Nienaber	Bisschoff
Work telephone:	056 343 3444	018 291 1411
E-mail address:	jnienaber001@gmail.com	Christo.Bisschoff@nwu.ac.za

I do thank you for your valuable time

Kind regards

Johan

* 1. I hereby give consent that my data may be used for research purposes.

If you answered "Yes" to the question, you will be directed to the next page to complete the questionnaire.

If you answered "No" to the question, you will be directed to the end of the questionnaire.

☐ Yes

☐ No

NWU MBA Research - Developing optimal segment-specific business models for agricultural crop protection distributors in South Africa

Information and Segment Specific Questions

* 2. Please complete the following information:

Name and Surname:	
Company / Farm:	
Address 1:	
Address 2:	
City / Town:	
Province:	
Postal Code:	
E-mail address:	
Telephone:	

* 3. Position you hold in the Company or Farm (i.e. Owner, Managing Director) - choose the most description option.

* 4. Please indicate the ownership structure of the farming business. Is this business owned by:

- ☐ Individual (i.e. Sole Proprietor)
- ☐ Close corporation (i.e. legal entity)
- ☐ Private company (i.e. (Pty) Ltd)
- ☐ Partnership
- ☐ Trust
- ☐ Agricultural Business (i.e. Overberg Agri, VKB)
- ☐ Public company (JSE Listed)
- ☐ Other

* 5. Answer only if applicable. Indicate the shareholding structure of the farming business. Please select one of the following options:

- ☐ 100% own shareholding
- ☐ External shareholding

* 6. If external shareholding is applicable to your business, please indicate the following?

	N/A	0.1% - 25.0%	25.1% - 50%	>50.1%
% shareholding	☐	☐	☐	☐
% foreign entity shareholding	☐	☐	☐	☐
% BBBEE shareholding	☐	☐	☐	☐

* 7. In which province or provinces do you cultivate your crops and/or have farming operations? **(Select multiple provinces if applicable)**

- | | |
|---|--|
| ☐ Eastern Cape | ☐ Mpumalanga |
| ☐ Free State | ☐ Northern Cape |
| ☐ Gauteng | ☐ North West |
| ☐ Kwazulu-Natal | ☐ Western Cape |
| ☐ Limpopo | |
| ☐ Other (please specify) | |

* 8. Which crops do you cultivate? **Please select all the applicable crops**

- | | |
|--|---|
| ☐ Citrus | ☐ Sub-tropical (Avo's, litchies, mango's, bananas) |
| ☐ Minor crops (for eg. Blueberries) | ☐ Table Grapes |
| ☐ Onions | ☐ Tomatoes (Table and Processed) |
| ☐ Oilseeds (Canola, Sunflower, Soya Beans) | ☐ Tree Nuts (Pistachios, Macadamias, Pecan) |
| ☐ Pome Fruit (for eg. Apples, Pears) | ☐ Vegetables (Cruciferae, carrots, cucurbits) |
| ☐ Potatoes | ☐ Wine Grapes |
| ☐ Stone Fruit (for eg. Peaches, Plums) | ☐ Winter Cereals (Wheat, Barley, Oats) |
| ☐ Summer Row Crops (Maize, Sorghum, Dry Beans, Peanuts) | |

9. Indicate the total hectares per crop (i.e. irrigated / dry land)?

	Ha Irrigated	Ha Dry Land
Citrus		
Minor crops (Blueberries)		
Onions		
Oilseeds (Canola, Sunflower, Soya Beans)		
Pome Fruit (Apples, Pears)		
Potatoes		
Stone Fruit (Peaches, Plums)		
Summer Row Crops (Maize, Sorghum, Dry Beans)		
Sub-tropical (Avo's, litchis, mango's)		
Table Grapes		
Tomatoes (Table and Processed)		
Tree Nuts (Pistachios, Macadamias, Pecan)		
Vegetables (Cruciferae, cucurbits, carrots)		
Wine Grapes		
Winter Cereals (Wheat, Barley, Oats)		

* 10. Which of the following statements BEST describe your farming operations with specific reference to Value Chain Integration (Own Packhouse, Pre-Packing, Own Exports, Own marketing, etc)?

- ☐ Exploratory
 ☐ Integrated and differentiated
- ☐ Limited and exploratory
 ☐ None
- ☐ Integrated

Factors impacting your decision when Procuring Agriculture Crop Protection Products

* 11. From which Agricultural Crop Protection Supplier do you procure your Agricultural Crop Protection Products? **Select all applicable options:**

- ☐ IntelliGro
- ☐ Laeveld Agrochem
- ☐ Nulandis
- ☐ Wenkem
- ☐ Other (please specify)

* 12. From whom do you procure your Agricultural Crop Protection Products? **Select all applicable options:**

- ☐ Crop Advisor (previously known as Agent)
- ☐ Agricultural Business (i.e. Afgri, Kaap Agri, Serwes, VKB)
- ☐ Crop Protection Supplier (i.e. Nulandis, LAC, Wenkem, IntelliGro)
- ☐ E-commerce (i.e. online platform)
- ☐ Crop Protection Manufacturer (i.e. BASF, Bayer, Corteva, Villa Crop Protection, UPL)

* 13. Based on the selected channel/s above. Which of the following product categories do you procure through this channel? **Please indicate all applicable:**

- ☐ Crop Protection Products (i.e. herbicides, insecticides, fungicides, nematicides)
- ☐ Specialised Plant Nutrition (i.e. foliar feeds, bio-stimulants, fertigation)
- ☐ Crop Protection and Specialised Plant Nutrition
- ☐ Granular fertilizers

* 14. What is the total value of your Crop Protection Products purchased in a season / annual basis?

- ☐ R0 to R999 999
 ☐ R5 000 000 to R5 999 999
☐ R1 000 000 to R1 999 999
 ☐ R6 000 000 to R6 999 999
☐ R2 000 000 to R2 999 999
 ☐ R7 000 000 to R7 999 999
☐ R3 000 000 to R3 999 999
 ☐ R8 000 000 to R8 999 999
☐ R4 000 000 to R4 999 999
 ☐ R9 000 000 to R9 999 999
☐ If more than R10 000 000 - Please specify amount

* 15. How do you finance the purchases of your Agricultural Crop Protection Products. (Select all applicable finance options):

- ☐ Own Funding
☐ Financial Institution / Commercial Banks (for eg. Landbank, Standard Bank, Absa, FNB)
☐ Agricultural Business / Company (for eg. Afgri, BKB, Eastern Cape Co-Op, OVK, VKB, Senwes)
☐ Input Suppliers (for eg. Syngenta Cultivault, Nulandis, LAC, Wenkem, InteliGro)
☐ Other (please specify)

16. Which of the following statements BEST reflect your purchasing of Agricultural Crop Protection Products?

- ☐ Own
☐ Buying Group
☐ Tender

* 17. What are the main factors which impact your decision when procuring your inputs from an Agricultural Crop Protection Supplier (for eg. LAC, Nulandis, Wenkem, InteliGro)? Rate all according to relevance:

	Not important	Somewhat Important	Important	Extremely Important	Essential
Relationship, trust and advice of the Agent	☐	☐	☐	☐	☐
Relationship, trust, brand of Crop Protection Company (for eg. LAC, Nulandis, InteliGro, Wenkem)	☐	☐	☐	☐	☐
Quality of the product	☐	☐	☐	☐	☐
Complete Crop Solution	☐	☐	☐	☐	☐
Price	☐	☐	☐	☐	☐

	Not important	Somewhat Important	Important	Extremely Important	Essential
Multi-National Corporate Brand (Research / Reputation - i.e. from Bayer, Syngenta, Corteva)	☐	☐	☐	☐	☐
Multi-National Corporate Product Brand (Product Brand name - for eg. Roundup)	☐	☐	☐	☐	☐
Generic product (due to efficacy and price - off-patent product - for eg. Villa Crop Protection, Adama, Meridian Agritech)	☐	☐	☐	☐	☐
Advice received from Independent Advisor	☐	☐	☐	☐	☐
Advice received from Crop Advisor (Previously known as Agent)	☐	☐	☐	☐	☐
Integrated Pest Management practices	☐	☐	☐	☐	☐
Market access (mainly influence product choice - Minimum Residue Profile)	☐	☐	☐	☐	☐
Traceability of product	☐	☐	☐	☐	☐
Technology (Disease models, Data-management platform, Cropwatch)	☐	☐	☐	☐	☐
Biological solution	☐	☐	☐	☐	☐
Logistical compliance and efficiency	☐	☐	☐	☐	☐
Access to data (historic and current)	☐	☐	☐	☐	☐
Funding	☐	☐	☐	☐	☐
Technical Support / Expertise	☐	☐	☐	☐	☐
Supplier support	☐	☐	☐	☐	☐
Convenience / Bulk Packaging	☐	☐	☐	☐	☐
Empty container removal	☐	☐	☐	☐	☐

* 18. Rate the level of service that you receive from your Crop Advisor (previously known as Agent / Representative) - **Rate each category please**

	Poor	Moderate	Acceptable	Good	Excellent
Technical Expertise	☐	☐	☐	☐	☐
Experience	☐	☐	☐	☐	☐
Involvement in the community	☐	☐	☐	☐	☐
Solutions focused	☐	☐	☐	☐	☐
Commercial offer	☐	☐	☐	☐	☐
Future orientation	☐	☐	☐	☐	☐
Open, honest, trustworthy	☐	☐	☐	☐	☐
Logistic effectiveness	☐	☐	☐	☐	☐
Market access support	☐	☐	☐	☐	☐
Supportive technology	☐	☐	☐	☐	☐
Professionalism	☐	☐	☐	☐	☐

*** 19. BUSINESS PROPOSAL:** How important are the following to you as a producer and in the decision-making process to acquire Crop Protection Products. (where 1 = least important, 7 = most important) **Please rate each category:**

	1	2	3	4	5	6	7
Business Terms (i.e. 30 days, 60 days, seasonal)	☐	☐	☐	☐	☐	☐	☐
Funding initiatives (for eg. Alliances with financial institutions, commercial bank products)	☐	☐	☐	☐	☐	☐	☐
Discount on cash payment	☐	☐	☐	☐	☐	☐	☐
Discount - volume	☐	☐	☐	☐	☐	☐	☐
Rebates	☐	☐	☐	☐	☐	☐	☐
Loyalty programmes	☐	☐	☐	☐	☐	☐	☐
Bulk / Container purchases	☐	☐	☐	☐	☐	☐	☐
Financial Solutions (for eg. Agrisafe, Cultivault)	☐	☐	☐	☐	☐	☐	☐
Guarantee on claims made from recommendation (put your money where your mouth is)	☐	☐	☐	☐	☐	☐	☐

*** 20. PRICE POLICY:** Which statement BEST describes your view on the pricing and decision-making on procuring / purchasing Crop Protection Products. **Please rate each category:**

	Totally Disagree	Disagree	Somewhat Agree	Agree	Totally Agree
Lowest Price	☐	☐	☐	☐	☐
Market related (obtain information through other producers)	☐	☐	☐	☐	☐
Tender Policy	☐	☐	☐	☐	☐
Customised (as negotiated)	☐	☐	☐	☐	☐
Price Benchmarking (obtain information from quotations)	☐	☐	☐	☐	☐

* 21. Looking into the future how would you prefer to purchase your Crop Protection Products? Rate according to relevance (where 1 = least relevant, 7 = most relevant) **Please rate each category:**

	1	2	3	4	5	6	7
Traditional Channel through Crop Advisor (previously known as Agent)	☐	☐	☐	☐	☐	☐	☐
Split Advice and Product - pay separate for advice and product	☐	☐	☐	☐	☐	☐	☐
Direct from Crop Protection Manufacturer (i.e. Bayer, BASF, Corteva, Villa Crop Protection, Meridian Agritech)	☐	☐	☐	☐	☐	☐	☐
Direct from Crop Protection Supplier (i.e. Nulandis, Laeveld Agrochem, InteliGro)	☐	☐	☐	☐	☐	☐	☐
Direct through Buying Group	☐	☐	☐	☐	☐	☐	☐
Direct from Cooperative / Agricultural Business (for eg. Afgri, Kaap Agri, Senwes, VKB, Die Kooperasie)	☐	☐	☐	☐	☐	☐	☐
E-commerce (online platform i.e. Takealot)	☐	☐	☐	☐	☐	☐	☐

* 22. Would you consider purchasing your Crop Protection Products from an online platform (i.e. Takealot)

☐

* 23. What would be your primary reason for procuring Crop Protection Products from an online platform (i.e. Takealot). Rate relevance (where 1 = least relevant; 7 = most relevant) **Please rate each category:**

	1	2	3	4	5	6	7
Bargain-hunting	☐	☐	☐	☐	☐	☐	☐
Transactional (Product focus)	☐	☐	☐	☐	☐	☐	☐
Benchmarking	☐	☐	☐	☐	☐	☐	☐
Convenience	☐	☐	☐	☐	☐	☐	☐
Current channel / model not optimal	☐	☐	☐	☐	☐	☐	☐
Other value-chain activities (i.e. insurance, technology, granular fertilizer, seeds)	☐	☐	☐	☐	☐	☐	☐

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Other decision / complementary information

- * 24. How important to you is access to the latest Technology (Disease forecasting models, scout models, electronic recommendations, Omni Channel models) from Agricultural Crop Protection Companies to support your farming operations?

None	Low	Variable	Medium	High
★	★	★	★	★

- * 25. Rate the relevance of the following INFORMATION to you as producer. (Where 1 = least relevant, 7 = most relevant) **Please rate each category:**

	1	2	3	4	5	6	7
Research Data - Intellect Solutions, Answer Plots	☐	☐	☐	☐	☐	☐	☐
Market Access - Export / Supermarkets, Minimum Residue Levels	☐	☐	☐	☐	☐	☐	☐
Crop specific recommendations	☐	☐	☐	☐	☐	☐	☐
Crop Manuals (Crop Physiology, Products Registered, Products Positioning)	☐	☐	☐	☐	☐	☐	☐
Innovation Platform (similar to Grain SA)	☐	☐	☐	☐	☐	☐	☐
Industry specific (i.e. potatoes)	☐	☐	☐	☐	☐	☐	☐
Biological Solutions / Regenerative Agriculture	☐	☐	☐	☐	☐	☐	☐
Personal account and transactional information electronic platform (current and history)	☐	☐	☐	☐	☐	☐	☐
E-commerce platform to access data and information (industry, workshops, training, product, crop info)	☐	☐	☐	☐	☐	☐	☐

* 26. Technical / Marketing: How often do you need the services or visits of Crop Advisors (i.e. Agents, Technical Advisors) of Agricultural Crop Protection Suppliers. **Please indicate frequency of each of the categories:**

	Ad-hoc	Annually	Bi-Annual	Quarterly	Monthly	Weekly	Two / three times weekly
Crop Advisor (Previously known as Agent)	☐	☐	☐	☐	☐	☐	☐
Crop Specialist	☐	☐	☐	☐	☐	☐	☐
Technical Advisors / Consultants	☐	☐	☐	☐	☐	☐	☐
Key Account Manager (Head Office representative)	☐	☐	☐	☐	☐	☐	☐

* 27. Would you be interested in acquiring equity in your Agricultural Crop Protection Company? (for eg. InteliGro, LAC, Wenkem, Nulandis)

* 28. If you answered "yes" to the question above, what would be your main consideration? **(Select all applicable considerations)**

- | | |
|--|---|
| ☐ Integrity | ☐ Gaining valuable information |
| ☐ Transparency | ☐ Partnership (alignment with input suppliers) |
| ☐ Cost synergy | ☐ Return on investment |
| ☐ Value-chain integration | ☐ Stronger commitment |

APPENDIX D: LANGUAGE EDITOR'S LETTER



Dynamic Language &
Translation Specialists

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Sunday, 13 December 2020

To whom it may concern

Re: Confirmation of language edit, typography and technical precision

The MBA dissertation by PJ Nienaber, "Developing segment-specific business models for agricultural crop protection distributors in South Africa" was edited for language, typography and technical precision. The referencing and sources were checked and comply to the Harvard guidelines specified by the 2020 NWU Reference guide.

Final, last minute corrections remain the responsibility of the author.

Antoinette Bisschoff

BA Languages (UPE – now NMU); MBA (PU for CHE – now NWU); Translation and Linguistic Studies (NWU)

Officially approved language editor of the NWU since 1998
Member of SA Translators Institute (no. 100181)

Precision ... to the last letter