Financial Feasibility of Investing in Bulk Soybean Infrastructure: The Case of an Evergreen Seed Agent

by

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ABSTRACT

For an Evergreen Seed Agent, making the financial decision to invest in bulk infrastructure is a large capital investment and requires a great deal of considerations. This thesis determines the soybean sales volume required for an investment in bulk soybean infrastructure to become financially feasible.

A total of 1,456 soybean sales data points were used to run a regression model. Based on the results of the regression model, a correlation was determined between those agents that have bulk soybeans and soybean sales growth in comparison to those agents that did not have bulk soybeans. A "Bulk Soybean Decision Tool" was constructed and demonstrates costs and earnings of an Evergreen Seed Agent over a five-year period. The financial feasibility analysis concluded that the soybean volume required to consider investing in bulk soybeans is 8,488 units. In addition to a break-even analysis, three other base year volume scenarios were demonstrated. At the 3,233 unit base soybean sales volume, it is not financially feasible to invest in bulk. At the 10,265 unit base soybean sales volume, it is finically feasible to invest in bulk soybeans. Lastly, at the 18,912 unit base soybean sales volume, it is finically feasible to invest in bulk soybean infrastructure.

The capabilities of the "Bulk Soybean Decision Tool" are significant for any Evergreen Seed Agent considering investing in bulk soybean infrastructure. Ensuring that an Evergreen Seed Agent is making a sound financial investment in bulk soybean infrastructure will allow for an increased adoption in infrastructure, resulting in increased soybean sales volume across the distribution network.

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CHAPTER I: INTRODUCTION

1.1 Background

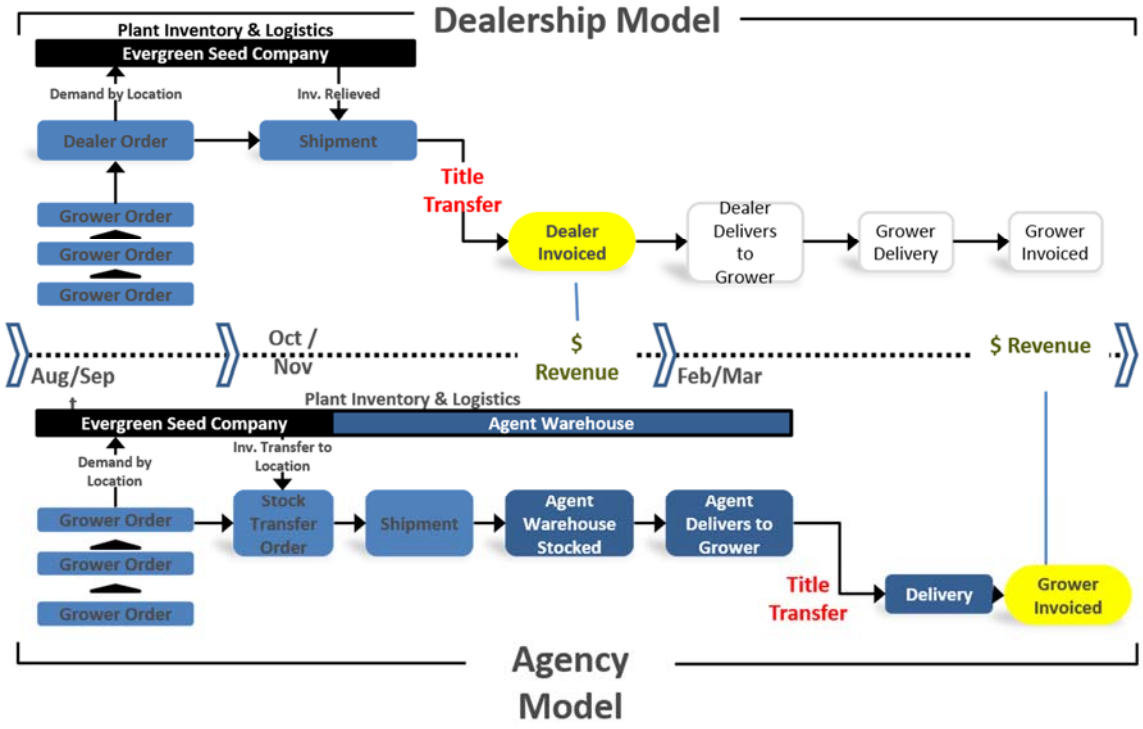
In the year 2009 Corporation A purchased the three brands known as, Firm X , Firm Y, and Firm Z and created a new brand known simply as "Evergreen." The vision behind this purchase was to create a brand new, premier brand of seed that offered farmers, or growers a high level of service and elite products in a way they had not experienced with other seed brands. To this day, the Evergreen brand focuses on service, professional advice, and high yielding genetics.

Combining once competing brands and creating a new company does not come without challenges. Although product lines narrowed, the distribution network was full of overlaps from the combination. The original brands in comparison to the new Evergreen brand were two completely different go-to-market strategies and attracted different customer bases. At this point, not every seed dealer from the legacy brands wanted to continue with the new Evergreen Brand, or would continue.

In 2014, in terms of market share, Evergreen is within the top three seed brands in terms of market share. Today it is the fastest growing seed brand, year-over-year, and continues to increase its market share. Despite the impressive growth, the vision that Corporation A has for the brand is not complete. Corporation A's vision for the brand is to be unique in the marketplace, to offer a different go-to-market strategy than it currently offered though its other brands. A new initiative called Evergreen 2.0 was put into motion. The Evergreen 2.0 is a strategy where the current Evergreen seed dealers would transition into Evergreen Seed Agents. Under the previous "dealership" model, Evergreen seed dealers own the seed and resold it using a suggested retail price, having the flexibility to

price the seed and bill their customers. As dealers, the "title transfer" occurred when the seed was delivered to the dealers' warehouse. Under the new agency model, Evergreen Seed Company owns the seed, and the "title transfer" occurs when the agent delivers the seed to the grower. Furthermore, under the new agency model, Evergreen Seed Agents are under contract to sell Evergreen Seed exclusively, meaning they cannot sell any other seed brands. Figure 1.1 demonstrates the change from a dealership model to an agency model.

Figure 1.1 Dealership Model vs. Agency Model



For many Evergreen seed dealers, the agency model was an easier transition as they were already selling the Evergreen line of products exclusively; however, for some, this meant significant changes within their own business models. During this transition period, many dealerships were terminated. For example, an Evergreen field sales team experienced a reduction in the number of Evergreen dealers with bulk soybean infrastructure. Three of the largest bulk soybean dealers were terminated in the state. These three seed dealers

accounted for approximately 60,000 units of soybeans, or twenty-five percent of their overall soybean business. Since the transition to Evergreen 2.0 and the termination of three bulk soybean dealers, attaining assigned soybean growth targets has been challenging. The field sales team has been unable to regain bulk soybean infrastructure within its current Evergreen Seed Agent network. Although cost-share programs for bulk soybean infrastructure programs have been in place since the beginning of the Evergreen Brand, our seed agents perceive the program as economically insufficient to make such a high financial commitment and capital outlay. For the 2018 sales year, the bulk infrastructure cost-share program has been restructured. This transformed cost-share program exhibits the capacity of being an effective tool in financially partnering with an Evergreen Seed Agent in their investment in a bulk soybean infrastructure system. To date; however, no Evergreen Seed Agents, from the referenced sales team, have taken advantage of the program nor invested in bulk soybean infrastructure.

1.2 Bulk Soybean Infrastructure Defined

As an industry standard, soybean seed is packaged and sold in four different packaging types and on a per unit basis. Within the Evergreen Seed Company, soybean seed is sold on a per unit basis with one unit equaling 140,000 seeds. On average, one unit is nearly equivalent to one soybean acre planted, depending on the planting rate. The four package offerings include bags, seed box, mini-bulk totes and bulk. Bags are sold on an individual basis, and typically packaged and transported on a pallet, totaling fifty bags per pallet. However, a farmer, or grower, can purchase the specific quantity needed for their operation. Seed boxes and mini-bulk totes are packaged and sold in forty-unit increments. Bulk soybeans can be ordered and delivered to grower to fit their exact quantity needs.

Bags would be used for smaller farming operations; bulk soybeans would be used in larger farming operations. Bulk packaging is delivered to an Evergreen Seed Agent in 1,000 unit increments via semi delivery. For an Evergreen Seed Agent to have bulk as a packing option, bulk soybean infrastructure must be in place. Bulk soybean infrastructure can be defined as an efficient way to handle, transport, and deliver larger volumes of soybean seed. Bulk soybean infrastructure typically involves four, four-thousand unit tanks, totaling 16,000 units. To see an example of a bulk infrastructure system and a delivery example, reference Appendix A.

1.3 Research Problem

At Evergreen Seed, Evergreen Seed Agents have an opportunity to increase profitability, increase operational efficiency, and compete locally; however, the low adaptability of the available recompensing bulk infrastructure program has left them in a position where reaching future sales targets and increasing market-share will require something different and innovative. The research question for this thesis is: What is the soybean volume required to determine the financial feasibility of an investment in bulk soybean infrastructure? This question is vital in projecting future sales growth target achievements, as well as quantifying which Evergreen Seed Agents will likely qualify for future bulk soybean infrastructure programs. The earning opportunities of an Evergreen Seed Agent and cost-share programs, as well as the costs associated with investing in a bulk soybean infrastructure system will be discussed in full detail.

1.4 Research Objectives

This research is being conducted in the perspective of an Evergreen Seed Agent who is, or will be able to invest in bulk soybean infrastructure. The purpose behind this

research is to have an increased adoption of bulk infrastructure among our Evergreen Seed Agents. This will be accomplished by completing the following research objectives:

1. Run a regression model and determine if a correlation exists between those Evergreen Seed Agents that have bulk soybeans and soybean sales volume growth.
2. Construct a “Bulk Soybean Decision Tool” that demonstrates the costs and earning potential of an Evergreen Seed Agent over a five-year period.
3. Determine Financial Feasibility of the investment based on three different soybean volume scenarios.

CHAPTER II: LITERATURE REVIEW

2.1 Evolution of Seed Packaging

2.1.1 The Demand for Efficiency

According to the United States Department of Agriculture, refer to Figures 2.1 and 2.2, the growing trend within the United States agricultural sector remains to be the ever-increasing acreage size with a decreasing number of farms and the ability to produce more output on less inputs. These growing trends allow for new technologies and innovations, with the growers being the center of the thought process behind these evolutions.

The way that seed is packaged and delivered is one of the many evolutions in farming practices. In an article published in the year 2000 by Successful Farming titled "Bulk seed sweeps the country," was the beginning of this packaging evolution (Fee, 2000). Prior to the year 2000, there were few options aside from purchasing seed in fifty-pound bags. One fifty-pound bag of seed for corn plants approximately two-and-a-half acres, while one fifty-pound bag of soybeans plants one acre. When observing the differences in seed needed for soybean in comparison to corn, there was a definite need to provide more effective and efficient packaging options for growers producing soybeans as they handle nearly three times the number of soybeans than corn. The increasing size of farms and the growing demands from growers for more efficient and effective packaging would drive the need for true bulk soybean packaging for the future.

2.1.2 Current Packaging Methods

According to the Successful Farming article, at the time, there were effectively five improved ways to packaging and/or handling seed. The first method was in bags that held 1,500 to 2,500 pounds of seed; today this is known as mini-bulk. The second was in "Q-

bit" containers made of plastic that held larger amounts of seed, also known as a seed box containing forty units of soybeans. The third was true bulk bins at dealer's business locations. The fourth was growers picking the seed up at conditioning plants and receiving a discount for picking it up on their own. The fifth was dealers delivering the seed right to the growers in the field.

2.2 Benefits of Going Bulk

Within the Successful Farming article, several reasons why the transition to bulk packaging was occurring. The first of these was for safety concerns. The second was convenience and ease. Lastly, the growth in farm size was fueling the interest in true bulk. A company called Novartis, a leading seed supplier based in Switzerland, was already anticipating the transition to true bulk and began piloting a program to "help dealers set up true bulk soybean delivery systems consisting of 2,000-3,000 bushel bins, scales and belt conveyors" (Fee, 2000). Ron Wegleitner, a grower, cattle feeder and Pioneer Hybrid Seed Inc. representative explained that "bulk is a fast, efficient way to handle seed, I can have one person doing a job that took two before. And it is safe. There is no lifting bags, or boxes over truck boxes or getting underneath them to open them" (Fee, 2000). Garst Seed Inc., was another company pointed out in the article that had a program for seed dealers to put in bulk soybeans. "Approximately twenty-five percent of their soybeans were sold in the form of bulk" (Fee, 2000).

In 2002, an article titled "Easy seed handling" was published by Wallaces Farmer, other seed companies like Syngenta Inc. and Monsanto Company were now also offering bulk soybeans as an option. A Syngenta Inc. seed dealer by the name of Dennis Hansmann, referred to their true bulk system as "TruBulk©," and explains that "farmers can pull into

our dealership, quickly fill the gravity wagon or bulk seed tender and be on their way to the field without having to handle bags or containers" (Swoboda, 2002). Mr. Hansmann also explained that "he was able to load 100 units of soybean seed in about three minutes, it's quick, efficient and all done with belt conveyers… for the farmer who races to plant a lot of acres each year within a narrow time frame, the time savings translates into more acres getting planted each day" (Swoboda, 2002). In addition to the ease of use, TruBulk© was also able to offer the flexibility for farmers to add fungicide seed treatments up until the day they planted. In conclusion, this article concludes that the biggest advantage to true bulk is that you will "save time and labor and you can get your crop planted on a more timely basis" (Swoboda, 2002).

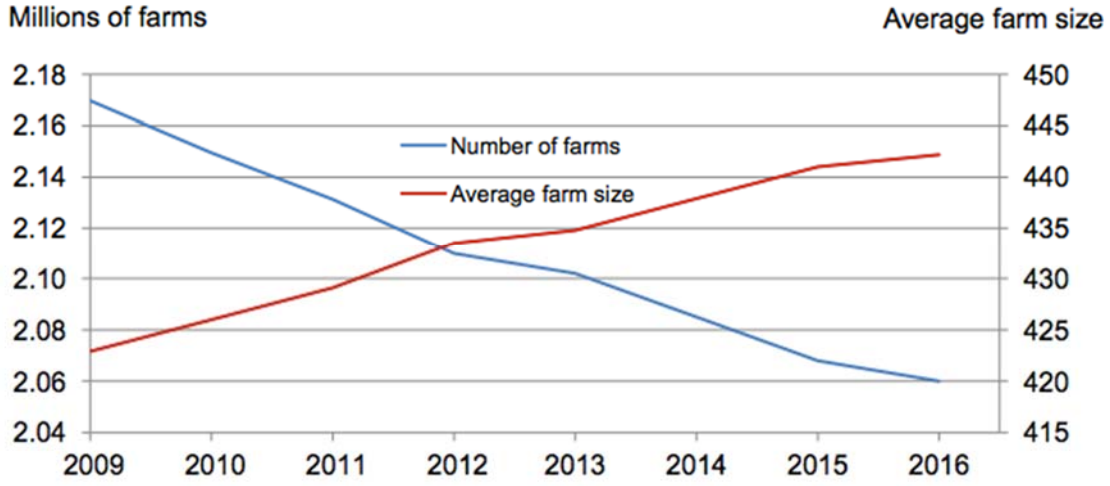
In 2006, bulk soybeans continue to become the industry standard. "Continual changes in efficiencies is what we're seeing because that's what the grower demands," said Gary Wietgrefe, TruBulk specialist at Syngenta's Sioux Falls, S.D., office" (Hagen, 2006). Wietgrefe also explained that the key to planting efficiently is to spend the minimum amount of time possible filling the planter. In addition to the expectations of improved efficiency driving the need for bulk, the rapid change in planting equipment was also a key driver in the seed industry's transition toward bulk soybeans. Seth Kveno, of NK Brand-Syngenta Seeds, explained that the "new center-fill planers are pushing seed handling towards bulk, just as air seeders did in the Red River Valley… faster delivery and twenty-four-hour accessibility meet the needs of today's farmers is what bulk seed handling offers" (Hagen, 2006).

The most recent article to date around the adoption of bulk soybeans was published in 2011 by Farm Industry News. In this article, Al Carlson, soybean product manager for

Dow AgroSciences, exclaimed that "what we are seeing now is an evolution in the soybean seed market… the amount of seed delivered in bulk is currently limited by the number of dealers and producers who have the on-farm capacity to handle the seed" (Moore, 2011). At this point, the move away from paper bags to bulk has been considerable, so much so that Gary Wietgrefe, soybean bulk manager for Syngenta, said that "for 2011, soybeans delivered through our TruBulk© system locations will exceed the amount we deliver in paper bags… producers are requesting bulk delivery of soybean seed directly to the farm, bypassing the bag altogether" (Moore, 2011). An added benefit to bulk soybeans that this article points out is the ability to deliver the exact quantity that the grower needs, and deliver it right to the field if needed. Instead of being restricted by the Q-bit plastic packaging or paper bag packaging, "if a grower needs136 units, we can sell and treat that amount and deliver it as one bulk package" (Moore, 2011).

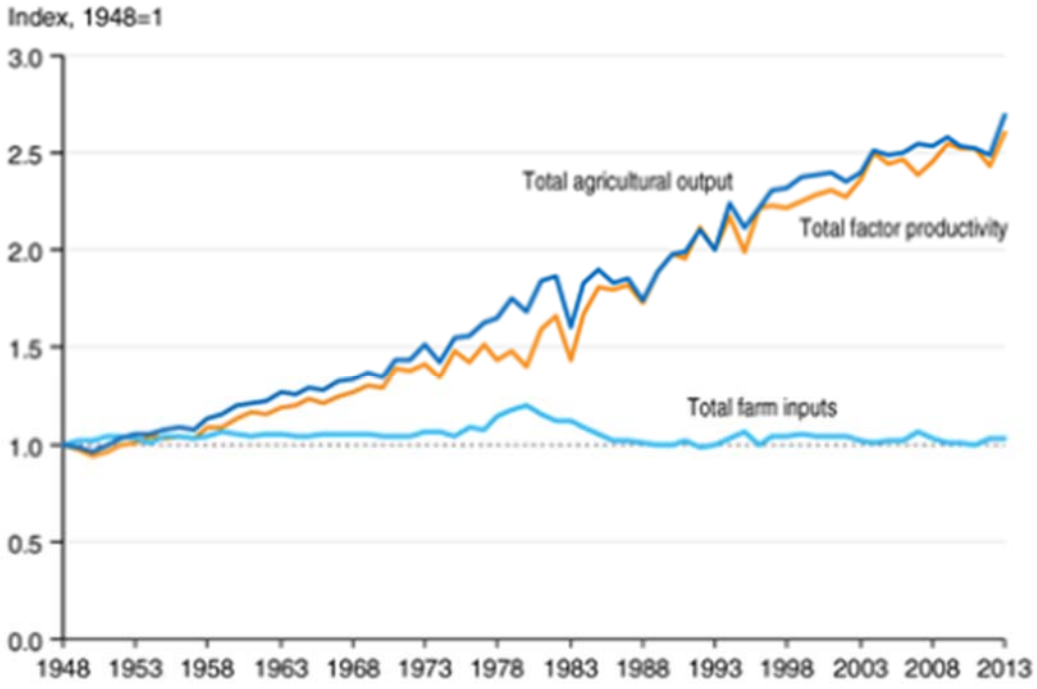
Although there were no recent articles published in the last few years around bulk soybeans adoption, we can conclude from Figure 1 that as farm size continues to grow, total farm output continues to increase. Per Figure 1, in the United States from 2009 to 2016 the average farm size increased from 422 acres to 443 acres and the number of overall farms decreased from 2.17 million farms to 2.06 million farms. Figure 2 represents the increase in overall efficiency of farming today. From 1948 to 2013, while inputs have stayed relatively constant, total agricultural output and the total factor of productivity have increased significantly. Growers are expecting more output with less inputs. These figures suggest the acceptance and demand for true bulk seed handling will continue to grow as farm sizes increase and the demand for efficiency continues.

Figure 2.1: The Number of Farms and Average Farm Size- United States: 2009-2016



Source: (United States Department of Agriculture, 2017)

Figure 2.2: U.S. agricultural output, inputs and total factor productivity, 1948-2013



Source: USDA, Economic Research Service, Agricultural Productivity in the U.S. data product. Data as of December 2015.

Source: (Economic Research Service, 2017)

CHAPTER III: THEORY

For an Evergreen Seed Agent to be willing to invest in bulk soybean infrastructure, they must be able to quickly pay off the investment and foresee long-term income gains and a feasible financial plan around bulk soybeans. This chapter will demonstrate multiple theories that will be used in this thesis including the corporate investment and financing decision process and valuing an investment opportunity including financial measures to determine the feasibility of a real asset investment (Brealey, Myers, & Allen, 2014).

3.1 Investment and Financing Decisions

An Evergreen Seed Agent must make an investment decision in regards to bulk infrastructure. An investment decision, according to "Principles of Corporate Finance," is simply defined as "a purchase of a real asset" (Brealey, Myers, & Allen, 2014). For this research the real asset would be the investment of a bulk soybean system. Although an investment decision can be simply defined, it "also involves managing assets already in place and deciding when to shut down and dispose of assets if profits decline… the corporation also must manage and control the risks of its investments" (Brealey, Myers, & Allen, 2014). In addition, "the financing decision includes not just raising cash today but also meeting obligations to the bank" (Brealey, Myers, & Allen, 2014). "Today's capital investments generate future cash returns; however, cash returns are not guaranteed" (Brealey, Myers, & Allen, 2014). It is essential to understand the investment in its entirety and make wise financial decisions with all given information available. Although these Evergreen Seed Agents do not have stockholders per say, they are the sole stockholder, as their livelihood depends on sound investments. An Evergreen Seed Agent would share the same three fundamental principles as stockholders: "to be as rich as possible, that is to

maximize his or her current wealth, transform that wealth into the most desirable time pattern of consumption either by borrowing to spend now or investing to spend later, and manage the risk characteristics of that consumption plan" (Brealey, Myers, & Allen, 2014).

3.2 Valuing an Investment Opportunity

3.2.1 NPV and IRR

As an Evergreen Seed Agent, how do you determine whether an investment opportunity is worth undertaking? The investment decision for bulk soybean infrastructure will use the concepts of Net Present Value (NPV) as well as the Internal Rate of Return (IRR). Net Present Value (NPV) can be defined as "a project's net contribution to wealth, the present value of the investment minus the initial investment" (Brealey, Myers, & Allen, 2014). The NPV will convert future cash flows into the current day value. The interest on the loan is not considered in the NPV calculation. To accept the project, we would expect the NPV to be a positive number. The Internal Rate of Return (IRR) is defined as "the rate of discount that makes NPV equal to zero" (Brealey, Myers, & Allen, 2014). The IRR will be calculated as another financial analysis tool. The IRR should be higher than the rate to accept a project. The interest rate on the loan will not be considered in the calculation of the IRR. The higher the IRR, the higher the likelihood that the project should be accepted. Together, these financial analysis measures will determine the worth of a future investment.

3.2.2 The Payback Rule

In addition to NPV and IRR, this research will use the payback rule and examine the payback period of the investment. "A project's payback period is found by counting the number of years it takes before the cumulative cash flow equals the initial investment" (Brealey, Myers, & Allen, 2014). The payback rule states, "that a project should be

accepted if its payback period is less than some specified cutoff period" (Brealey, Myers, & Allen, 2014). For this research, five years is used as the payback period. In addition, the payback period for this thesis will review three different soybean volume scenarios to determine the payback period.

CHAPTER IV: PROCEDURES AND METHODS

4.1 Procedure Description

This chapter will examine the necessary procedures for demonstrating the feasibility for an Evergreen Seed Agent to invest in bulk soybean infrastructure. This study will focus on the question what soybean volume is required to determine the financial feasibility of an investment in bulk soybean infrastructure. This chapter will include a description of the methods that will be used to answer the question. To deliver on the outlined research problem and objectives there are several pieces of information needed to collect. First, collecting the soybean sales data of Evergreen Seed Agents that have invested in bulk soybean infrastructure, and those Evergreen Seed Agents that do not have bulk soybean infrastructure, will be essential in understanding the growth of sales that occurs with bulk soybeans. Second, a financial analysis accounting for our agent's commissions, cost-share programs, and value-added services. Third, the average cost of a bulk soybean system from our local supplier including four tanks, cement work, electrical work, and seed treater, will be obtained to determine the average cost of bulk soybean infrastructure.

Additionally, the methods section includes a breakdown of the regression model that will be estimated and financial feasibility analysis using the "Bulk Soybean Decision Tool," by applying three different soybean volume scenarios. Material that will be discussed at length around the "Bulk Soybean Decision Tool" will include the average cost breakdown of inputting a bulk soybean system, Evergreen Brand's bulk soybean infrastructure program, known as TOP, a breakdown of our Evergreen Seed Agents' compensation model and the average income potential of incorporating seed treating, or value-added services, into the bulk soybean system.

4.2 Regression Model

A regression model will be run to determine a correlation between those Evergreen Seed Agents that have bulk soybean systems and those that do not and how this relates to soybean sales volume growth.

The selection of the independent and dependent variables will be chosen to form the regression model. Sales growth, or negative growth, data from the years 2015-2016, 2016-2017 and 2017-2018 will be provided by the company. However, the data will need to be cleaned appropriately to ensure the most accurate regression model. These data polishing measures will be discussed in the upcoming data chapter within this document. The only two considerations necessary for variables are that of growth and whether the growth is associated to an Evergreen Seed Agent that has bulk, or does not have bulk. The sales period, or time aspect, and the Evergreen's Seed Agents business name are irrelevant for this regression model and were eliminated. The model will use growth units as the dependent variable, stated "GrowthUnits." The independent variable for this regression model will be titled "Bulk," and will determine the growth units, or soybean volume, correlated to those Evergreen Seed Agents that have bulk soybeans. Those Evergreen Seed Agents that do have bulk will be numbered with "1," to their correlated growth, or negative growth number. Those that do not have bulk soybeans will be labeled with a "0," with their correlated growth, or negative growth number. The estimation model will be stated as such:

$$\text{Growth Units} = \alpha + \beta_1 * \text{BULK} + \varepsilon$$

Using the previous estimation model, the sign of the coefficient will be hypothesized. Next, a program that completes regression, econometrics and time-series models, or Gretl 2017, will estimate the equation. Lastly, the statistical significance of the independent variable

"Bulk" will be analyzed determining if there is a correlation to those Evergreen Seed Agents that have bulk and those do not and if it relates to growth.

4.3 The "Bulk Soybean Decision Tool"

In addition to exploring the discovering the correlation of bulk soybeans and soybean growth, a "Bulk Soybean Decision Tool" will be constructed in excel for our Evergreen Seed Agents to use to determine if investing in bulk soybean infrastructure is economically feasible for their individual business needs. Currently within The Evergreen Brand, no such tool exists that would demonstrate a financial breakdown of the cost of a bulk soybean system in relation to the potential earnings opportunity of an Evergreen Seed Agent. In the past, this has always been left up to our Evergreen Seed Agents to breakdown such complex earning and cost scenarios.

This tool will allow for flexibility. An Evergreen Seed Agent will be able to input their starting soybean volume, year-end net sales, and optional seed treatment earnings. In building the "Bulk Soybean Decision Tool" considerations that will be incorporated into the model will include the potential income avenues for an Evergreen Seed Agent including, their soybean compensation per unit earnings, based on the Evergreen Seed Agent compensation model, the TOP infrastructure program earnings, seed treatment earnings, and any additional cost-share opportunities earnings. The previous income avenues will be the basis for how the decision tool is organized. Ease-of-use and transparency for our Evergreen Seed Agents will be top of mind in the formation of the tool. These costs and earning opportunities will be broken down for five sales years. Five years was the assumed payoff periods as the TOP infrastructure program dollars can be

earned for up to five years. The TOP infrastructure program will be explained in further detail in section 4.3.2 of this chapter.

In addition to the cost and earnings breakdown for five years, the payback periods, Internal Rate of Return, or IRR, and Net Present Value, or NPV, measurements will also be taken to understand if this is a sound investment for an Evergreen Seed Agent. Three different scenarios will be reviewed examining different Evergreen Seed Agent soybean volume levels. The payback period, IRR, and NPV will be measured for each of the three scenarios. This will determine financial feasibility of implementing a bulk soybean system at each of the three scenarios.

4.3.1 Determining the Three Volume Scenarios for the "Bulk Soybean Decision Tool"

In determining the three Evergreen Seed Agent volume scenarios for using in the "Bulk Soybean Decision Tool," for financial feasibility analyses, a consensus of the total sales data, will be used as well as if they have bulk soybeans or not. The validation behind this method will be to determine the average soybean volume of an Evergreen Seed Agent in each of the volume categories and if they have bulk soybeans or not. The result will be three average Evergreen Seed Agent volumes, one from each assigned volume category, that does not have bulk soybeans. Non-bulk Evergreen Seed Agents will be selected because financial feasibility for those that do not currently have bulk soybeans is the focus. These methods will be ideal in providing the "Bulk Soybean Decision Tool" three, data-driven, scenario selections and will allow for the TOP financial feasibility examples of inputting bulk soybeans.

4.3.2 The Cost of Inputting a Bulk Soybean System

Determining the cost of the system was the first step in building the "Bulk Soybean Decision Tool." For the purposes of this research, it was assumed that the cost of the bulk

infrastructure system will stay constant. The price of the system is not necessarily determined by the market cost of metal, for example. It was also assumed that an Evergreen Seed Agent would want the most automated system. If an Evergreen Seed Agent did not want to have a fully automated system, the overall cost would decrease. For purposes of this research, the most expensive configuration of the system was used, less a seed treatment system. The quoted price of a bulk soybean system was $288,990.57. This quote did not include a new seed treating system and the two pump stands, totaling $50,006.00. If an Evergreen Seed Agent wished to include the new seed treating system the total system cost, with tax, would be $341,246.84. For this research, it was assumed that the Evergreen Seed Agent already had a seed treating system. Figure 4.1 includes a cost breakdown of the initial cost of investing in a bulk infrastructure system. A notable asset within the bulk system included four bulk tanks, equivalating to a soybean volume capacity of 16,000 units.

In addition, to the cost of the bulk soybean system, the cost of the five-year loan at a 6% interest rate will also be considered. For the “Bulk Soybean Decision Tool,” a total of $343,026.61 will be used as the total cost. This includes the total cost of the system, in addition to the cost of interest over a five-year note. This cost will be divided out into five yearly payments across the decision tool, equaling a payment of $68,605.32 per year.

Table 4.1 Initial Cost of Bulk Infrastructure Set-up, 16,000-unit Capacity

Quantity	Description	Unit Price	Quote
1	USC TL TRUCK UNLOAD CONVEYOR & CONFIGURATION	$5,612.00	$5,612.00
1	USC BF35 PORTABLE CONVEYOR & CONFIGURATION	$25,242.00	$25,242.00
4	MERIDIAN SEEDMAX 4000 BIN & CONFIGURATION	$19,822.00	$79,288.00
1	USC UBIN UNDERBIN CONVEYOR & CONFIGURATION	$19,268.00	$19,268.00
1	USC TS35 STATIONARY CONVEYOR & CONFIGURATION	$13,118.00	$13,118.00
1	USC TRI-FLO	$29,144.00	$29,144.00
1	USC AUTOMATION CONTROL PANELS	$18,720.00	$18,720.00
1	USC AUTOMA TION PACKAGE	$26,532.00	$26,532.00
1	USC TS25 PORTABLE CONVEYOR & CONFIGURATION	$10,272.00	$10,272.00
1	Total Freight for all equipment	$9,350.00	$9,350.00
1	Estimated Concrete Costs	$25,000.00	$25,000.00
1	Estimated Electical Costs*	$15,000.00	$15,000.00
	Subtotal	$217,080.00	$276,546.00
	Estimated Tax (4.5%)		$12,444.57
	Estimated Total*		$288,990.57
	*Assumes existing electical service		

4.3.3 The TOP Infrastructure Program

The investment in bulk soybean infrastructure will be initially funded by the Evergreen Seed Agent; however, a cost-share program, TOP, is available for a seed agent to take advantage of and recuperate up to $125,000 of the investment costs. The details behind this program will help determine the economic feasibility for an Evergreen Seed Agent to invest in bulk soybean infrastructure. There are no initial qualification requirements to become a part of the program from the Evergreen Brand; however, there

are restrictions on what equipment qualifies for the program. The following infrastructure is approved under the Evergreen TOP cost-share infrastructure program:

Allowable Expenses:

- Bins
- Underbin conveyor
- Transition conveyors and air gates
- Bin automation
- Batch scales & automation
- Truck unload and bin load conveyor

In addition to allowable equipment expenses, the TOP program also states that Evergreen brand agrees to a maximum partnership allowance of $125,000 over a five-year contract period. A payment will occur to the Evergreen Seed Agent each year for up to five years. The payment will be calculated each year as a $4 per soybean unit multiplied by the total net soybean sales, or $25,000, whichever is higher. This yearly payment will occur until the Evergreen Seed Agent reaches the maximum cost-share of $125,000, or a $25,000 payment for each year for up to five years, whichever comes first. For example, if an Evergreen Seed Agent sells 10,000 units of soybeans, he or she would receive a $40,000 payment from the Evergreen Brand. If they sold 6,250 units of soybeans, they would receive the $25,000, for example.

The “Bulk Soybean Decision Tool” will incorporate formulas to determine the correct compensation level of the Evergreen Seed Agent based on their volume and percent to their assigned sales target to determine correct yearly earnings. For the three scenario purposes, this model will assume that an Evergreen Seed Agent will meet 100% of their

business plan goal each year for five years. For the use of this tool in the real world, an Evergreen Seed Agent will have the flexibility to type in what their year end net sales is, or could be. It will also be assumed that for the payback model,

4.3.4 Soybean Sales Compensation for an Evergreen Seed Agent

Evergreen Seed Agents are paid on a tier-based compensation model and on a per-unit basis. To put this in perspective, one soybean unit sold by an Evergreen Seed Agent is equal to approximately one acre planted by a grower. As previously discussed in the introduction and literature review, most soybeans are sold in either bags, seed boxes and/or mini bulk totes. Under the current Evergreen compensation model, new fiscal year business plan goals are determined by their previous year net sales. Table 4.2 demonstrates the assigned growth goal for the new fiscal year at all Evergreen Seed Agents volumes.

Table 4.2 Evergreen Seed Agent Minimum Assigned Growth Goals

Previous Year Net Soybean Sales Volume	New Fiscal Year Assigned Growth Goal %
25,000+	101%
20,000-24,999	103%
15,000-19,999	105%
12,500-14,999	107%
10,000-12,499	109%
7,500-9,999	115%
5,000-7,499	117%
2,500-4,999	125%
0-2,499	138%

In addition to the Evergreen Seed Agents assigned growth goal, or sales target, the percent to this growth rate determines at which rate an Evergreen Seed Agent is compensated. Table 4.3 provides a breakdown of the compensation tiers an Evergreen Seed Agent could fall into, based on their net sales to their assigned growth goal.

Table 4.3 Evergreen Seed Agent Soybean Compensation Per Unit

% to Assigned Growth Goal	Compensation Per Unit
0%	$3.00
75%	$3.50
85%	$3.75
90%	$4.00
95%	$4.25
100%	$4.50
105%	$4.75
120%	$5.00

The "Bulk Soybean Decision Tool" will reference both the "Evergreen Seed Agent Minimum Assigned Growth Goal" 4.2 Table, as well as the "Evergreen Seed Agent Soybean Compensation" 4.3 Table, in formula form.

4.3.5 Incorporating Seed Treating into Value-Added Services

As a value-added service and additional revenue stream, many Evergreen Seed Agents choose to treat soybeans for their customers. Although it is a cost to the grower customer, it is proven to protect their soybeans seedlings from early season pests and help with early vigor. The Evergreen Brand, along with Corporation A's Seed Treatment division, incentivize Evergreen Seed Agents to treat exclusively with their products. Although numerous add-on products are available for down-stream treating, the two products that are used most frequently used include Seed Treatment 1, which is a fungicide offering, and Seed Treatment 2, which is a fungicide and insecticide offering. The Seed Treatment division averages that an Evergreen Seed Agent earns $3.80 on each unit of soybeans treated with Seed Treatment 1, and $6.86 on each unit of soybeans treated with Seed Treatment 2. These are estimated commission dollars were provided by the Seed Treatment division of Corporation A. An Evergreen Seed Agent can charge what they see fit for each of the seed treatments. In addition to the average commission rates, an

Evergreen Seed Agent can also earn a $0.50 commission bonus on their total treated soybean units if they treat a minimum of 70% of their total soybean sales volume with either the Seed Treatment 1, or Seed Treatment 2, or a combination. These incentives can add a significant revenue source on a per soybean unit basis, especially when combined with the regular commission schedule. In terms of the generalizing the seed industry, it is assumed that an Evergreen Seed Agents that would implement bulk soybeans, would offer seed treating as a value-added service.

4.3.6 "Bulk Soybean Decision Tool" Assumptions

For the three scenario purposes, this model will assume that an Evergreen Seed Agent will meet 100% of their business plan goal, or sales targets, each year for five years. For the use of this tool in the real world, an Evergreen Seed Agent will have the flexibility to type in what their year end net sales is, or could be, if it was below their sales target. It will also be assumed that for the payback model, IRR and NPV, the potential earnings from compensation, seed treatment, and the TOP agreement will go towards paying for the bulk infrastructure system. It is possible, for uses outside of this research that a cost of living expense could be deducted from the earnings potential. This means that all income earned, less the yearly loan payment, will go back into paying for the bulk soybean system. However, it should be noted that this model does not include any income an Evergreen Seed Agent would earn on corn volume sales, which is much more lucrative than soybean sales earnings. Lastly, it will be assumed that a loan will be taken out for the dollar amount of $288,990.57, at a rate of 6% over five years. This will make the total cost of the asset equal to $343,026.61.

For the seed treatment portion of the model, it was assumed that an Evergreen Seed Agent would treat 70% of their total soybean sales volume, earning the seed treatment bonus of $0.50 per unit multiplied by the number of treated soybean units. For flexibility for future use of this tool, it is possible for an Evergreen Seed Agent to change the percentage of seed treated as well as their commission dollars to make it relevant to their specific business. For this model; however, it was assumed that an Evergreen Seed Agent would earn $3.80 on Seed Treatment 1 and $6.86 Seed Treatment 2. As previously stated, commission earned on seed treatment is based on what an Evergreen Seed Agent charges for these value-added services.

CHAPTER V: DATA COLLECTION AND ANALYSIS

5.1 Introduction to the Data Collection

The data for this research is provided by the Evergreen Brand. This data will include sales periods from 2015 to 2016, 2016 to 2017, and 2017 to 2018. The sales data began in 2015 for two reasons. The first reason is that these were the sales years that the company provided. The second reason is that there is direct correlation between Evergreen 2.0, the transition to the agency model, and the data. The year 2015 was the first full year of the Evergreen 2.0 transition. The data collection process will be separated into two sections, the data used for the regression model, and the data used for the creation of the "Bulk Soybean Decision Tool."

This chapter will include an analysis of the data used for the regression model and the "Bulk Soybean Decision Tool." The chapter will be organized into three sections. The first section will include an analysis of the data used to run the regression model that will determine if having bulk soybean infrastructure correlates to having growth in soybean sales. Additionally, a detailed outline of how the data is used will be discussed. The second section will include a data analysis, which describes the content of the data being used in both the regression model as well as the "Bulk Soybean Decision Tool." The last section will include a detailed breakdown of what the "Bulk Soybean Decision Tool" entails for an Evergreen Seed Agent to determine if bulk soybeans are a financially feasible investment.

5.2 Data Collection for the Regression Model

The sales data used was provided by the company. For the integrity of this research necessary parameters will be put in place to determine if the sales data would be used. The first parameter for the sales data to be usable is that if Evergreen Seed Agent did not have any sales in 2018, they were eliminated. The assumption here is that it if they did not have

sales data, they are no longer with the company. This allowed for any sales data from 2015, 2016, 2017, or 2018 from Evergreen Seed Agents that were no longer with the company to be eliminated. This process is completed on a master sales sheet including the name of the Evergreen Seed Agent, if they have bulk soybeans (Y or N), 2015 net soybean sales, 2016 net soybean sales, 2017 net soybean sales, and 2018 current grower orders, as the 2018 sales year is not complete. This data collection resulted in one sheet with a list including the Seedsman Name, Bulk "Y" or "N," and their respective sales years for 2015-2018. An example of the first fifteen data points is provided below in Table 5.1.

Table 5.1 Example 1 of Data Consensus: Reducing the Data

Evergreen Seed Agent	Bulk	2015 Total Net	2016 Total Net	2017 Total Net	2018 Grower
Seed Agent 1	Y		2689	6682	7762
Seed Agent 2	N			15270	15514
Seed Agent 3	Y	16525	14868	18508	16910
Seed Agent 4	N	10731	11881	13472	8379
Seed Agent 5	N	3443	6567	4967	3752
Seed Agent 6	N	287	895	3036	3901
Seed Agent 7	N	1305	948	303	661
Seed Agent 8	Y		21317	31665	37074
Seed Agent 9	N	12015	13395	19331	22234
Seed Agent 10	N		489	299	360
Seed Agent 11	N	2775	3318	3078	2008
Seed Agent 12	N	461	0	215	1120
Seed Agent 13	N			640	1070
Seed Agent 14	Y	8737	10725	19070	24763
Seed Agent 15	N	4968	4340	5168	3971

The second parameter put in place for the data included each of the three separate sales period worksheets including 2015 to 2016 soybean sales data, 2016 to 2017 soybean sales data, and 2017 to 2018 soybean sales data. This parameter removed any Evergreen Seed Agent that did not have sales data for each of the two sales years being analyzed. For example, if we reference Table 5.1, in 2015-2016 there is no sales data for "Seed Agent 1" for 2015. This agent would have been removed from the 2015-2016 data sheet because

they did not begin to have sales until 2016. The data for this agent would begin on the 2016-2017 sales data sheet. This process allowed for each of the three sales period worksheets to have a final, year end positive or negative growth number. In Table 5.2, the first fifteen data points are shown for the worksheet "Sales Data 15-16." This provides an example of how the end "Growth" number was found by subtracting the 2016 sales from the 2015 sales. This same process was completed for both 2016-2017 sales data and 2017-2018 sales data.

Table 5.2 Example 2 of Data Consensus: Obtaining the Growth Number

Evergreen Seed Agent	Bulk	2015 Total Net Sales	2016 Total Net Sales	Growth
Seed Agent 1	Y	16525	14868	-1657
Seed Agent 2	N	10731	11881	1150
Seed Agent 3	N	3443	6567	3124
Seed Agent 4	N	287	895	608
Seed Agent 5	N	1305	948	-357
Seed Agent 6	N	12015	13395	1380
Seed Agent 7	N	2775	3318	543
Seed Agent 8	N	461	0	-461
Seed Agent 9	Y	8737	10725	1988
Seed Agent 10	N	4968	4340	-628
Seed Agent 11	Y	4517	5950	1433
Seed Agent 12	N	5905	5977	72
Seed Agent 13	N	1148	1487	339
Seed Agent 14	N	2671	3744	1073
Seed Agent 15	N	4250	2482	-1768

The final data for the regression model data includes a consensus of all three sales data worksheets from 2015-2016, 2016-2017, and 2017 to 2018. This worksheet focused specifically on if the sales data came from an Evergreen Seed Agent with bulk or without bulk, and their correlating growth volume number, positive or negative, from any of the given years, 2015-2016, 2016-2017, and 2017-2018. As with the other worksheets, those

agents with bulk were labeled with a "Y" and those without bulk soybeans were labeled with a "N." An assumption to note, is when generating this data sheet is that if an Evergreen Seed Agent had bulk, it was assumed that they had bulk for all the sales years. Once the final growth numbers with their correlating Evergreen Seed Agent, and whether they had bulk or not is in place, the Evergreen Seed Agents name is removed, as it is not necessary for the regression. Lastly, all those with a "Y" or "N" columns are changed to either a "1" or a "0." Those with bulk are labeled with a "1," those that do not have bulk are labeled with a "0." An example of the first fifteen data points from the final data set for the regression model is found in Table 5.3.

Table 5.3 Example 3 of Data Consensus: Final Data for the Regression Model

Bulk	Growth Units
1	-1657
0	1150
0	3124
0	608
0	-357
0	1380
0	543
0	-461
1	1988
0	-628
1	1433
0	72
0	339
0	1073
0	-1768

To reiterate the purpose of the regression model, it is to determine the statistical correlation of those Evergreen Seed Agents that have bulk soybeans, and those Evergreen Seed Agents that do not and how it relates to soybean growth volume. This model informs the research question: What soybean volume is it financially feasible for an Evergreen Seed

Agent to invest in a bulk infrastructure system? More specifically, it will answer the first objective within the research question, which is to determine if there is a correlation between those Evergreen Seed Agents that do have bulk infrastructure and those that do not in relation to soybean sales volume and growth.

5.3 Data Analysis

This section will include an analysis of the contents of the sales data. To gain an understanding of what makes up the data, the Evergreen seed agents that have bulk or do not have bulk will be categorized. An analysis of each of the sales data sheets, 2015-2016, 2016-2017, and 2017-2018, is reviewed by determining the average sales volume of the Evergreen Seed Agents in each year with bulk, and without bulk. Table 4.1 illustrates the average size of the seed agents across each of the four sales years.

Table 5.4 Average Size of an Evergreen Seed Agent with and without Bulk Soybeans

	2015	2016	2017	2018
With Bulk	12,167	12,288	14,555	13,256
Without Bulk	5,024	4,835	5,323	4,480

Additionally, the sales volumes of the seed agents will be categorized into three volume tiers: sales volume from 0-7,499 units, sales volume from 7,500-14,999 units and sales volume from 15,000 and up. These volume levels were selected by dividing the compensation model, illustrated in Table 4.2, into three sections. This provides an understanding of the volume tiers that make up the sales volume data and whether the Evergreen Seed Agents do, or do not have bulk soybeans in association to a quantified volume category. This volume breakdown is discussed in further detail in the section 5.3.1.

The sales data from the years 2015 to 2016 includes a total of 409 Evergreen Seed Agents that are included in the analysis. Of the 409 Evergreen Seed Agents, 63 of them

have bulk soybeans. Of those that have bulk soybeans, 15 are between the volumes of 0-7,499, 33 are between the volumes of 7,500-14,999, and 15 are 15,000 or more. Table 5.5 represents a complete make up of the data.

Table 5.5 2015-2016 Sales Data Analysis

Soybean Volume	With Bulk	Without Bulk	Total
0-7,499	15	279	294
7,500-14,999	33	53	86
15,000+	15	14	29

The sales data from the years 2016 to 2017 includes a total of 476 Evergreen Seed Agents that are included in the analysis. Of the 476 Evergreen Seed Agents, 77 had bulk soybeans. Of those that have bulk soybeans, 17 are between the volumes of 0-7,499, 29 are between the volumes of 7,500-14,999, and 31 are 15,000 or more. Table 5.6 represents a complete make up of the data.

Table 5.6 2016-2017 Sales Data Analysis

Seed Agent Soybean Volume	With Bulk	Without Bulk	Total
0-7,499	17	314	331
7,500-14,999	29	63	92
15,000+	31	22	53

The sales data from the years 2017 to 2018 includes a total of 571 Evergreen Seed Agents that are included in the analysis. Of the 571 Evergreen Seed Agents, 81 of them have bulk soybeans. Of those that have bulk soybeans, 20 are between the volumes of 0-7,499, 32 are between the volumes of 7,500-14,999, and 29 are 15,000 or more. Table 5.7 represents a complete make up of the data.

Table 5.7 2017-2018 Sales Data Analysis

Seed Agent Soybean Volume	With Bulk	Without Bulk	Total
0-7,499	20	412	432
7,500-14,999	32	63	95
15,000+	29	15	44

It is important to note that in the 2017 to 2018 analysis, the 2018 sales year is not complete. Thus, this data is a total grower order estimate rather than the actual net sales number. It is safe to say, that it should not change much given planting will begin over the next month or two, but should still be noted and considered in the results. Another important note to make is that there are 75 new Evergreen Seed Agents for 2018 that will not have sales data included in the regression model because they did not meet the two-year minimum requirement. Of the 75 new Evergreen Seed Agents for 2018, four have bulk soybean infrastructure.

In total, there are 1,456 total sales volume observations that will be incorporated into the regression model. Of the total 1,456 total sales volume observations, 221 data points are from those Evergreen Seed Agents with bulk soybeans, the remaining 1,235 are from those Agents without bulk soybeans. The overall data is represented in the following Figure 5.1 and was formed from the Table 5.8.

Figure 5.1 Number of Evergreen Seed Agents vs. Soybean Sales Volume

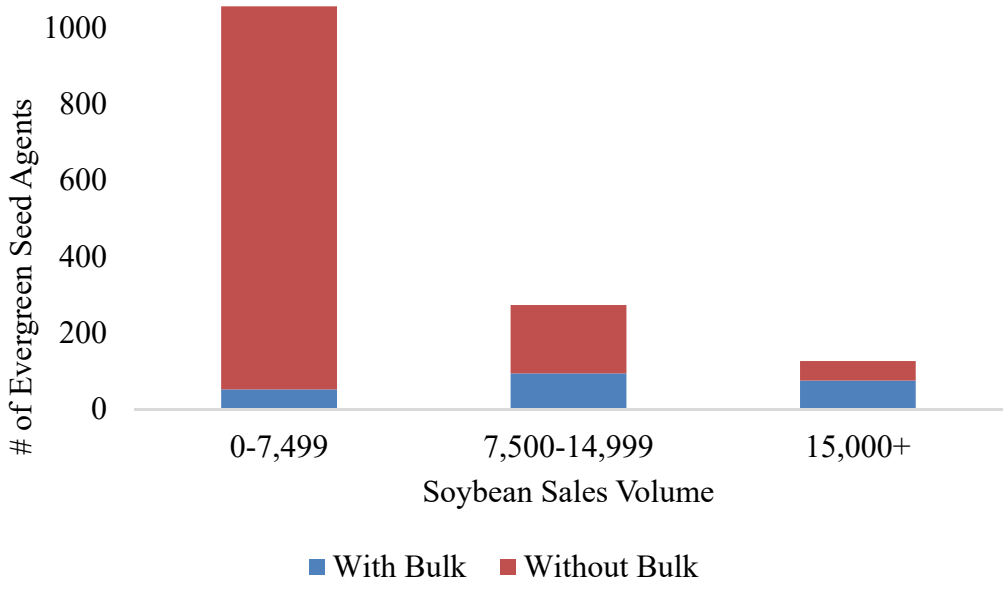


Table 5.8 Total Data Consensus for Gretl Regression

Seed Agent Soybean Volume	With Bulk	Without Bulk	Total
0-7,499	52	1005	1057
7,500-14,999	94	179	273
15,000+	75	51	126
	221	1235	1456

5.3.1 Data Analysis for Three Volume Scenarios within "Bulk Soybean Decision Tool"

In determining financial feasibility of implementing a bulk soybean system, volume scenarios were decided based on the average Evergreen Seed Agent Soybean Volume within each Volume category, 0-7,499, 7,500-14,999, and 15,000 and greater. The data used to determine the three volume scenarios consists of all the sales years, 2015-2016, 2016-2017, 2017-2018 using their net sales from the most recent year. For example, in the sheet 2015-2016, the 2016 net sales data would be used in determining the volume category. Each Evergreen Seed Agent is categorized as either a small, or "S, a medium, or" "M," or a large, or "L," agency by their respective sales volume from 0-7,499, 7,500-

14,999, and 15,000 and greater, respectively. Categorizing the volume data is accomplished swiftly by sorting the net sales data by smallest to greatest. The same data set found in Figure 5.1, and Table 5.8 are used in determining the three volume scenarios.

To find the average volumes in each of the small, medium and large volume categories in relation to if agents have bulk soybeans or not, an "AVERAGEIFS" function in the excel worksheet is used. By formulating excel to average the net sales number if the net sales number belonged to an Evergreen Seed Agent that did, or did not have bulk, and if their net sales volume fell into the "S," "M," or "L," volume category, the result is the average net sales volume per volume category and if they did or did not have bulk. Table 5.8 shows the result of this formulation.

Table 5.9 Average Net Sales Volume by Volume Category

Soybean Volume	Volume Category	Bulk	Average Net Sales Volume
0-7,499	S	Y	5,560
0-7,499	S	N	3,233
7,500-14,999	M	Y	10,768
7,500-14,999	M	N	10,265
15,000+	L	Y	22,469
15,000+	L	N	18,912

From Table 5.8, the analysis determines the three Evergreen Seed Agent volume scenarios. The scenario volumes will include, 3,233 units from the small volume category, 10,265 units from the medium volume category, and 18,912 units from the large volume category. These three volumes will be demonstrated in the "Bulk Soybean Decision Tool" to understand if it is finically feasible for an Evergreen Seed Agent to invest in bulk infrastructure at any of these three volumes. The results of this are discussed in the next chapter.

As previously demonstrated in Table 5.6, the 2018 order bank quantifies Evergreen Seed Agents into the following volume categories: 412 Evergreen Seed Agents currently fall within the 0-7,499 volume level, 63 fall between the 7,500- 14,999 sales volume level, and 44 are included in the 15,000 and up sales volume level. This is a total of 490 Evergreen Seed Agents that do not currently have bulk soybeans. In the next chapter, the number of Evergreen Seed Agents that should consider investing in bulk infrastructure based on the financial feasibility results will be discussed.

5.4 Creating the "Bulk Soybean Decision Tool"

The "Bulk Soybean Decision Tool" is designed for an Evergreen Seed Agent to review the financial feasibility of inputting a bulk soybean infrastructure system. An example of the decision tool can be found in Appendix B. The tool looks at a five-year financial period accounting for the initial cost of the investment and potential earnings for each of the given five years. As previously discussed, a period of five years is used because the TOP infrastructure cost-share program included a payout of up to five years. For this thesis, the only variable number within the model will be "Base Year Volume." For an Evergreen Seed Agent to use this tool, each box in grey can be adjusted to fit their individual business needs. This includes the "Total Investment Cost," "Base Year Volume," "Actual Year End Net Sales," Percent of Sales Volume Treated," and "Earnings/Unit" within Seed Treatment 1 and Seed Treatment 2.

The total investment cost of $343,026.61 is used for the total cost of the infrastructure system for the model. For this thesis, the investment cost will remain constant at $343,026.61, and includes the cost of the infrastructure and cost of the five-year loan at a rate of 6%. The breakdown of the loan is found in the tab "Payment Schedule"

within the tool. It is possible for an Evergreen Seed Agent to adjust the cost of the investment, as well as the loan period and rate for a real-world scenario. The decision tool would adjust automatically to the personalized figures.

"Base Year Volume" is the only variable within the model. The "Base Year Volume" is the point in soybean sales where an Evergreen Seed Agent is at today. The five-year financial analysis is based on the "Base Year Volume." As previously determined, three different base year volume scenarios will be entered in the model to determine financial feasibility.

Yearly earnings are determined based on year end soybean sales volume, business plan goal achievement, seed treatment earnings, commission earnings, and cost-share program earnings. The tool can be separated into three sections of information. The first section is "Business Plan Growth Achievements." The "Assigned Growth Percentage" is determined by the "Base Year Volume" and adjusts accordingly to the "Evergreen Seed Agent Minimum Assigned Growth Goal," which can be found in Table 4.2 in Chapter 4. Based on the "Assigned Growth Percentage," the tool calculated the new "Business Plan Goal." For this thesis, it is assumed that an Evergreen Seed Agent will achieve 100% of their business plan goal and be paid his/her commission based on 100%. It is possible, in a real-world scenario, for an Evergreen Seed Agent to type in their "Actual Year End Net Sales" to determine the appropriate commissions. The commission payout schedule referenced in the tool can be found in Table 4.3, "Evergreen Seed Agent Soybean Compensation Per Unit."

In the second section, "Acceleron Seed Treatment," earnings are estimated in the tool. The "Percent of Sales Volume Treated" is assumed to be 70% of the "Actual Year

End Net Sales." It is possible for an Evergreen Seed Agent to adjust percent of sales volume treated based on their individual business needs. Additionally, it assumed that an Evergreen Seed Agent is earning $3.80 per unit of Seed Treatment 1, and $6.86 per unit treated with Seed Treatment 2. It is possible for an Evergreen Seed Agent to change the earnings/unit on these treatment options. The tool adjusts accordingly to these changes. Additionally, the tool factors in a "Evergreen Seed Agent Treatment Bonus." This bonus is earned if an Evergreen Seed Agent treats a minimum of 70% of their total year end net sales. The tool accounts for the income adjustment of $0.50 per unit multiplied by the number of units treated, if 70% of the soybean sales are treated. For this thesis, it is assumed that an Evergreen Seed Agent treats 70% of their soybeans and earns the bonus.

In the third section of the model "Estimated Earning Potential," the total earning potential is projected. The earnings potential includes a combination of "Total Treatment Earnings," "Total Soybean Commission Earnings," "Estimated Potential Cost-Share Earnings," and "Total TOP Agreement Earnings." These earnings combined sums the "Total Earning Potential." The "Total Treatment Earnings" is taken from the previous section "Acceleron Seed Treatment" total. "Total Soybean Commission Earnings," is based on the total "Actual Year End Net Sales" multiplied by the dollar rate per unit in relation to the percent of the "Business Plan Goal" achieved. Referring to Table 4.3, at 100% of the Business Plan Goal Achieved equivalates to a $4.50 per unit payout. "Total TOP Agreement Earnings," is based on the TOP infrastructure cost-share program. The tool calculates the total payout of the program of $125,000 across five years. It assesses the "Actual Year End Net Sales," and determines if the payout will be either $4 per unit, or $25,000, whichever is higher. Since the program is capped at five years and $125,000, it

also determines if the $125,000 is met before the end of five years and calculates the appropriate payout.

The only expense determined in this model is the expense of the infrastructure. As previously mentioned, the loan payment will be demonstrated as a yearly payment for five years, at a 6% interest rate. This expense will be labeled as "Yearly Loan Payment" within the tool." This expense will be equal to $68,605.32 each year.

The "Net Revenue" for each year will be calculated by taking the "Total Earning Potential" less the "Yearly Loan Payment." "Accumulated Net Earnings" is the final piece at the end of each year. This includes a total of the current year earning potential in addition to the previous years earning potential.

The entire setup for the tool is repeated five times, for five years. The only difference to note is that year two, "Base Year Volume" is not used, rather "Year 1 Volume End" is used. This is the same for years three, four and five, and uses the previous year's sales volume end to determine the correct earnings.

Lastly, within the end of the tool, there is a "Five Year Total Earning Potential." This is a total sum of the Net Revenue across the five modeled years. This earning potential will be used to determine financial feasibility of inputting a bulk infrastructure system, along with the accumulated net earnings. An example of the "Bulk Soybean Decision Tool" over the five-year period can be referenced in the Appendix B of this document.

5.4.1 Payback Period

In addition to the "Decision Tool," the payback period of the project is modeled in the tab "Payback Period." This model allows for an Evergreen Seed Agent to understand over a five-year period if the infrastructure is payed off, and if it is, in what year, and at what point in the year. The "Discounted Pay Back Period" determines at which point in the

year is the infrastructure payed off. For example, if year two there was a positive balance of $56,675, at some point in the year it was paid off. By using the “Discounted Pay Back Period” it is determined that it was paid off in 1.71 years. An example of the Payback Period can be referenced in Appendix C of this document.

5.4.2 NPR and IRR

The Net Present Value, or NPV and Internal Rate of Return, or IRR will be demonstrated for each “Base Year Volume” in the tab “NPR AND IRR.” These calculations will show an Evergreen Seed Agent the value of the investment if they were to invest in bulk infrastructure in comparison to keeping the same money in the bank at a 6% interest rate. This model demonstrates the opportunity cost of the investment. The NPV and IRR will be updated automatically if the “Base Year Volume” changes from the “Decision Tool” tab. An example of the NPV and IRR can be referenced in Appendix C of this document.

CHAPTER VI: RESULTS

6.1 Introduction to the Results

The purpose of this thesis is to answer the research question: "What soybean volume is it financially feasible for an Evergreen Seed Agent to invest in a bulk infrastructure system?" The results of the research question, as well as, the research objectives will be discussed in detail in this chapter. The research objectives include examining the soybean sales data to run a regression model, creating a "Bulk Soybean Decision Tool" that will allow for an Evergreen Seed Agent to interpret financial feasibility based on their base soybean volume, and lastly, and then use the "Bulk Soybean Decision Tool" to run three different Evergreen Seed Agent volume scenarios to determine the financial feasibility of the investment.

The chapter is organized into two sections. The first section will discuss the results of the regression equation. The second section will discuss the results of the financial feasibility analysis based on the three different soybean sales volume scenarios, as well as a break-even analysis.

6.2 The Regression Equation Results

The purpose of the regression equation was to determine if there is a correlation between those Evergreen Seed Agents that have bulk soybeans and those that do not, in relation to growth of soybean sales volume. In review, the regression model equation:

$$\text{Growth Units} = \alpha + \beta_1 * \text{BULK} + \varepsilon$$

is entered into Gretl 2017. "GrowthUnits" is used as the dependent variable, "Bulk" is used as the independent variable. This regression is assumed to be a linear model.

The following Figure 6.1 represents the regression output:

Figure 6.1 Regression results of the relationship between the bulk soybean infrastructure and growth in soybean sales volume

Model 1: OLS, using observations 1-1456
Dependent variable: GrowthUnits

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	25.2088	76.9528	0.3276	0.7433	
Bulk	492.79	197.519	2.4949	0.0127	**

Mean dependent var	100.0072	S.D. dependent var	2709.169
Sum squared resid	1.06e+10	S.E. of regression	2704.318
R-squared	0.004263	Adjusted R-squared	0.003578
F(1, 1454)	6.224516	P-value(F)	0.012710
Log-likelihood	−13571.17	Akaike criterion	27146.33
Schwarz criterion	27156.90	Hannan-Quinn	27150.28

The result of the regression output determined the final equation for the estimated model to be the following:

$$GrowthUnits = 25.209 + 492.79 * Bulk$$

The estimated coefficient indicated that for every additional one unit of growth in soybeans, an Evergreen Seed Agent that has bulk soybeans can expect 492.79 units of growth in comparison to an Evergreen Seed Agent that does not have bulk soybeans. This coefficient is statistically significant at the 5% significance level since p-value is 0.0127, which is less than 0.05. The low p-value in this scenario suggests that there is a response to growth being correlated to those that have bulk soybeans. The data suggests that an Evergreen Seed Agent will experience soybean volume growth if he or she were to implement a Bulk Soybeans.

In conclusion to this section, there is indeed a statistical correlation between those Evergreen Seed Agents that had bulk soybeans in relation to growth of their soybean sales volume. This is significant from a company perspective as can build a confidence level within our agents that it is highly likely that implementing a bulk soybean structure will

result in the growth of their soybean business at a faster rate than if they continue to operate without investing in bulk soybean infrastructure. It should also be noted that the overall increase in sales volume from those that invest in bulk infrastructure would amount to a greater yearly compensation payout.

6.3 Financial Feasibility Results of Investing in Bulk Infrastructure

The following results were determined by using the "Bulk Soybean Decision Tool" constructed in excel. The financial feasibility of investing in bulk soybean infrastructure will be discussed using the "Base Year Volumes" 3,233, 10,265, and 18,912 units. The investment will be determined as financially feasible if the total cost of the infrastructure and the cost of the loan, $343026.61, can be paid back within the five-year period. The break-even volume point will also be discussed to give an understanding of how many soybean unit sales it would take to break-even on a bulk soybean infrastructure system over a five-year period.

6.3.1 Scenario 1 Results: At the 3,233 Soybean Volume Level

At the 3,233 base soybean sales volume level, the accumulated net earnings across five years was equal to $58,763.23. At this level, the investment in bulk soybean infrastructure would be deemed as not financially feasible, nor profitable. The payback period occurs within 4.16 years. The NPV after five years would be equal to $45,127.70. This investment has an IRR of 11.16%. Although the NPV is positive, and the payback period occurs under five years this volume does not provide a sufficient income to support the investment of bulk soybean infrastructure. Currently, among the Evergreen Seed Agents for 2018 grower orders, there are 236 that have sales at, or below, the 3,233 base

soybean sales volume level and do not currently have bulk. This represents 48% of the total Evergreen Seed Agents that do not currently have bulk soybeans.

6.3.2 Scenario 2 Results: At the 10,265 Soybean Volume Level

At the 10,265 base soybean sales volume level, the accumulated net earnings across five years was equal to $391,855.18. At this level, the investment in bulk soybean infrastructure would be determined as financially feasible and somewhat profitable. Assuming all income earned went into paying off initial investment into the bulk infrastructure system, the Payback Period would be 2.11 years. The Payback Period assumes the initial cost of the investment in year 0, and only considers profit for the following years. The NPV of the investment after five years is equal to $332,308.45. The IRR is equal to 43.19%. In other words, the project investment should be considered as the IRR is significant. In reviewing the total number of current Evergreen Agents that do not have bulk soybeans based on 2018 grower orders, 39 currently fall between the volumes of 10,265 and 18,912. This represents 8% of the total Evergreen Seed Agents that do not currently have bulk.

6.3.3 Scenarios 3 Results: At the 18,912 Soybean Volume Level

In the 18,912 soybean sales volume level, the accumulated net earnings across five years was equal to $769,712.40. At this level, the investment in bulk soybean infrastructure would be determined as financially feasible and would earn a significant profit. Assuming all income earned went into paying off initial investment into bulk soybean infrastructure system, the Payback Period would be equal to 0.89 years. The NPV was equal to $655,414.05, and the IRR was equal to 78.27 %. At this volume, there are currently 7 Evergreen Seed Agents that have soybean sales at or above 18,912 that do not currently have bulk.

6.3.4 Break-Even Analysis

The break-even point for investing in bulk infrastructure occurs at the base sales volume of 8,488 units, when using the total cost of $343,026.61. The total earnings across five years at 8,488 units is $343,027.33. At this base sales volume level, there are currently 93 Evergreen Seed Agents that would be at, or above a base sales volume of 8,488 units. An example of the break-even point analysis being used in the "Bulk Soybean Decision Tool" can be found in the Appendix.

CHAPTER VII: CONCLUSIONS

7.1 Introduction to Conclusions

The financial feasibility of an Evergreen Seed Agent investing in Bulk Soybean Infrastructure was determined by their specific base year sales volume. Methods and procedures were used to examine the current sales data of those Evergreen Seed Agents with and without bulk soybeans and how it correlated with soybean sales growth. A regression model was interpreted to determine a correlation in soybean sales growth for those Evergreen Seed Agents that have bulk soybeans in comparison to those that do not. A "Bulk Soybean Decision Tool" was constructed considering all earnings and costs for an Evergreen Seed Agent to determine financial feasibility of the investment. Three different base soybean sales volumes, as well as a break-even analysis, were analyzed in the "Bulk Soybean Decision Tool" to determine the results if investing in bulk infrastructure is a financially feasible. This chapter will discuss conclusions based on the research of this thesis. These conclusions will include a reiteration of the results, drawbacks to be considered, further studies to be considered and overall concluding thoughts.

7.2 Reiteration of the Results

In considering the cost of the loan at 6% interest, in addition to the cost of the bulk infrastructure system, the total cost of a bulk infrastructure system at a 16,000-unit capacity is equal to $343,026.61. At this cost, the breakeven point occurs at the base year volume of 8,488 units and the Net Revenue is equal to $343,041.05, over the five-year period. In reviewing the three base soybean volume scenarios different conclusions on financial feasibility were made. At 3,233 units, bulk soybean infrastructure is not feasible. At both the 10,265, and 18,912 base volume levels, bulk soybean infrastructure is not only feasible, but it is also profitable.

From the perspective of an Evergreen Seed Agent, investing in bulk infrastructure can not only provide an agency with additional profits, it can bring other value aspects to their business. Other value-added considerations could include positive perceptions from their customers, increased efficiency for their business and their customer's businesses, and safety considerations.

From the grower customer's perspective, they may choose to do business with someone that can accommodate their exact needs. Implementing bulk soybeans would allow for an Evergreen Seed Agent to deliver the exact quantity of soybeans a grower needs. Additionally, they may be able to deliver on this more efficiently. Efficiency in the eyes of the grower would look like an Evergreen Seed Agent delivering their soybean seed right to the field in a seed tender versus delivering seed boxes with a truck and trailer to their yard. Additionally, the appearance of an Evergreen Seed Agency that has bulk soybeans may appear as though they are investing in their business and are showing a long-term relationship with the brand. These ideas combined would lead to increased positive perceptions of an Evergreen Seed Agency to their grower customers.

When considering increased efficiency and safety that bulk infrastructure may add to an Evergreen Seed Agency, the amount of times a seed box, would be handled should be considered. In an average sales season, an Evergreen Seed Agent, that does not have bulk soybeans, would handle a seed box up to six times. Implementing bulk soybeans would eliminate the excessive handling of boxes, and potentially the use of boxes altogether. This added efficiency factor of eliminating seed boxes, could allow for more warehouse space, less labor, and an added safety benefit.

7.3 Drawbacks to be Considered

Based on this research, investing in bulk infrastructure is a financial feasible option; however, there are a few drawbacks that may influence an Evergreen Seed Agent to not invest. The first drawback would be that even though the capacity for sales volume has increased, the number of soybean seed varieties decreases in the process. If the 16,000-unit capacity at four bulk tanks example is used, in general, this would mean that an Evergreen Seed Agent has up to four varieties to sell to their customers. If an Evergreen Seed Agent wished to have more varieties available, the bulk tank would need to be completely "turned," or emptied, to allow for room for an additional variety to be delivered.

A second drawback that an Evergreen Seed Agent may consider would be the need to potentially train their customers to use seed tender delivery or pick up their soybeans right at the source, versus seed box tender delivery methods. This will not be true for every customer; however, the change in delivery methods could be a drawback in some customers point of view that do not have the equipment that allows for seed tender delivery.

Lastly, volatility in the soybean market price and the soybean trait technology offerings may also be considered. When considering such a high investment cost for an Evergreen Seed Agent, the future of the company, specifically future and current trait technology offerings would be considered.

7.4 Further Studies to be Considered

To improve this study, or further this research, a few considerations could be made. The first consideration could be an addition of a variable in the regression model. Since the earnings from selling corn were not considered in this research, an additional variable in the regression model could be considered to determine if investing in bulk soybean

infrastructure could also correlate to an increase in corn volume sales. The second consideration is an improvement. The regression and overall data on 2018 could be redone based on the final 2018 net sales orders, versus the grower orders that are currently being used. This would make all four years of sales data consistent. A forth consideration that could be made is calculating the depreciation effect on the investment. In addition to a depreciation schedule, additional tax implications could be considered. A final consideration that could be made is around the efficiency of implementing bulk soybeans. A savings number could be generated using the cost of labor of handling a seed box each time in addition to the cost of the warehouse space that a seed box would use. These considerations would only positively add to the overall research that investing in bulk soybeans is financially feasible.

7.5 Conclusion

In conclusion, it is a hope that the "Bulk Soybean Decision Tool" in conjunction with this research, will result in an increased adoption of bulk infrastructure among our current Evergreen Seed Agents. The tool and this research will provide the Evergreen Brand with effective material to bring to Evergreen Seed Agents to promote the investment in bulk infrastructure. Training in using the decision tool for the Evergreen Seed Agents, as well as the salesforce, should be considered.

Increased adoption of bulk soybeans would not only result in increased soybean sales volume, but also an uptake in the number of Evergreen Seed Agent partaking in the TOP infrastructure program. The increased adoption of bulk soybeans under the infrastructure program would result in a commitment for five years. The costs of leaving the company during this point in time would increase the cost of the bulk system, and overall transaction cost for the Evergreen Seed Agent. Lastly, bringing effective tools to the

Evergreen Seed Agents will aid in growing the business relationship, specifically the opportunity to be considered a true business partner. The result will be long-term commitment to the Evergreen brand from the Evergreen Seed Agents with an enhanced distribution network to allow for growth of the brand.

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APPENDIX A

Bulk Soybean Infrastructure Example:

Image Provided by: (Seed, 2018)

Bulk Soybean Seed Tender Delivery Example:

Image Provided by: (Unverferth, 2018)

APPENDIX B

Evergreen Bulk Soybean Infrastucture Decision Tool

Total Infrastucture Investment Cost:	$ 343,026.61	$343,027.33
Base Year Volume:	8,425	

Year 1

Business Plan Growth Achievements:

Assigned Growth Percentage:	115%
Business Plan Goal:	9,689
Actual Year End Net Sales:	9,689
% to Business Plan:	100%

Acceleron Seed Treatment:

Percent of Sales Volume Treated:	70%
Estimated Treatment Volume:	6,782

	Earnings/unit	Appox. % Units
Seed Treatment 1	$3.80	0%
Seed Treatment 2	$6.86	100%

Seed Treatment 1 Earnings	$	-
Seed Treatment 2 Earnings	$	46,525
Evergreen Seed Agent Treating Bonus	$	3,391
Total:	$	49,916

Estimated Earning Potential:

Total Treatment Earnings:	$	49,916
Total Soybean Commission Earnings:	$	43,599
Total TOP Agreement Earnings	$	38,755
Total Earning Potential :	**$**	**132,271**
Yearly Loan Payment:		**($68,605.32)**
Net Income:		**$63,665.49**
Accummulated Net Earnings:	$	63,665

Year 1 Volume End:	9,689	

Year 2

Business Plan Growth Achievements:

Assigned Growth Percentage:	115%
Business Plan Goal:	11,142.06
Actual Year End Net Sales:	11,142
% to Business Plan:	100%

Acceleron Seed Treatment:

Percent of Sales Volume Treated:		70%
Estimated Treatment Volume:		7,799
	Earnings/unit	Appox. % Units
Seed Treatment 1	$3.80	20%
Seed Treatment 2	$6.86	80%

Seed Treatment 1 Earnings	$	5,928
Seed Treatment 2 Earnings	$	42,803
Evergreen Seed Agent Treating Bonus	$	3,900
Total:	$	52,631

Estimated Earning Potential:

Total Treatment Earnings:	$	52,631
Total Soybean Commission Earnings:	$	50,139
Total TOP Agreement Earnings	$	44,568
Total:	**$**	**147,338**

Yearly Loan Payment:	**($68,605.32)**
Net Income:	**$78,732.86**
Accummulated Net Earnings:	$ 142,398

Year 2 Volume End:	11,142	

Year 3

Business Plan Growth Achievements:

Assigned Growth Percentage:	109%
Business Plan Goal:	12,145
Actual Year End Net Sales:	12,145
% to Business Plan:	100%

Acceleron Seed Treatment:

Percent of Sales Volume Treated:		70%
Estimated Treatment Volume:		8,501
	Earnings/unit	Appox. % Units
Seed Treatment 1	$3.80	20%
Seed Treatment 2	$6.86	80%

Seed Treatment 1 Earnings	$	6,461
Seed Treatment 2 Earnings	$	46,656
Evergreen Seed Agent Treating Bonus	$	4,251
Total:	$	57,367

Estimated Earning Potential:

Total Treatment Earnings:	$	57,367
Total Soybean Commission Earnings:	$	54,652
Total TOP Agreement Earnings	$	41,677
Total:	**$**	**153,696**

Yearly Loan Payment:	**($68,605.32)**
Net Income:	**$85,090.65**
Accummulated Net Earnings:	$ 227,489

Year 3 Volume End:	12,145	

Year 4

Business Plan Growth Achievements:

Assigned Growth Percentage:	109%
Business Plan Goal:	13,238
Actual Year End Net Sales:	13,238
% to Business Plan:	100%

Acceleron Seed Treatment:

Percent of Sales Volume Treated:		70%
Estimated Treatment Volume:		9,267
	Earnings/unit	Appox. % Units
Seed Treatment 1	$3.80	20%
Seed Treatment 2	$6.86	80%

Seed Treatment 1 Earnings	$	7,043
Seed Treatment 2 Earnings	$	50,855
Evergreen Seed Agent Treating Bonus	$	4,633
Total:	$	62,530

Estimated Earning Potential:

Total Treatment Earnings:	$	62,530
Total Soybean Commission Earnings:	$	59,570
Total TOP Agreement Earnings	$	-
Total:	**$**	**122,101**

Yearly Loan Payment:	**($68,605.32)**
Net Income:	**$53,495.63**
Accummulated Net Earnings:	$ 280,985

Year 4 Volume End:	13,238

Year 5

Business Plan Growth Achievements:

Assigned Growth Percentage:	107%
Business Plan Goal:	14,165
Actual Year End Net Sales:	14,165
% to Business Plan:	100%

Acceleron Seed Treatment:

Percent of Sales Volume Treated:		70%
Estimated Treatment Volume:		9,915
	Earnings/unit	Appox. % Units
Seed Treatment 1	$3.80	20%
Seed Treatment 2	$6.86	80%

Seed Treatment 1 Earnings	$	7,536
Seed Treatment 2 Earnings	$	54,414
Evergreen Seed Agent Treating Bonus	$	4,958
Total:	$	66,908

Estimated Earning Potential:

Total Treatment Earnings:	$	66,908
Total Soybean Commission Earnings:	$	63,740
Total TOP Agreement Earnings	$	-
Total:	**$**	**130,648**
Yearly Loan Payment:		**($68,605.32)**
Net Income:		**$62,042.70**
Accummulated Net Earnings:	$	343,027

5 Year Total Earning Potential:		**$343,027.33**
5 Year Total Earnings Potental Per Unit:	**$**	**5.68**

APPENDIX C

Payback Model Example in Bulk Soybean Decision Tool

Payback Model		
Year	Cash Flow	Balance
0	$ (288,990.57)	$ (288,990.57)
1	129078.2043	$ (159,912.37)
2	148439.935	$ (11,472.43)
3	153910.5523	$ 142,438.12
4	123013.9908	$ 265,452.11
5	131624.9702	$ 397,077.08
Discounted Pay Back Period	4.16	Years

NPV Example in Bulk Soybean Decision Tool

NPV and IRR				
Year	Cash Flow	Present Value	Interest Rate	6%
0	$ (288,990.57)	$ (288,990.57)		
1	$ 129,078.20	$ 121,771.89		
2	$ 148,439.93	$ 132,111.01		
3	$ 153,910.55	$ 129,226.27		
4	$ 123,013.99	$ 97,438.60		
5	$ 131,624.97	$ 98,357.83		
	NPV	$ 289,915.04		
	IRR	38.255%		