

TERRABACTER

BUSINESS PLAN AND PROPOSAL



terrabacter
making soil better

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TerraBacter LLC would like to thank the mentors at TYE Atlanta for their superb guidance. If you have any questions or concerns, or simply want more information, please send an email to terrabacter@gmail.com or call (770) 695 2557. Thanks!

EXECUTIVE SUMMARY

Food is essential for life. The world demand for food is constantly increasing to support the rising population. However, acid rain is decimating potential arable land and leaving farmers with pennies left from the hard labor. Over 7 million square miles (almost 15% of the total land area of earth) is affected by acid soils. Hundreds of thousands of farmers across the world barely grow enough food to sustain their fledgling businesses or are forced to sell their farms because the acid soils prevent them from their crops. Acid soils destroy these people's livelihoods, a sad fact that TerraBacter hopes to change.

In order to combat the high acidity of the soil that is killing the crops, farmers have used lime treatments. Lime pellets or powder are sprinkled onto fertilizer or directly onto the soil causing it to become less acidic. However, the cost and the constant need to replace the lime in short period of time outweigh the farmers' benefits from using lime. We believe that our product is better and more efficient at fixing the problem of acidic soils than lime treatment.

TerraBacter LLC has discovered an innovative solution to this problem. TerraBacter uses a unique approach of adding a microbe called *Geobacter metallireducens* to the soil in order to increase the pH of the soil so that crops are able to grow and farmers can bring home more profits. TerraBacter was built on the idea that the product could provide a low-cost, time-effective solution that allows farmers to increase their yearly crop yield significantly. The harmless microbes are employed to more efficiently eliminate the high acidity levels of the soil.

TerraBacter targets the bioremediation industry which is valued at almost \$8 billion per year in North America alone, according to Frost and Sullivan's 2008 study. Farmers and farmers' unions are constantly searching for the latest technology to increase their crop yield and we believe TerraBacter could provide the answer to this pressing problem.

TerraBacter will require \$750,000 in startup funding for initial tolling to labs and to set up distribution channels. (The full breakdown of these costs is provided in Appendix A.) Investors can expect 180% return on investment (ROI) within three years. Not only does TerraBacter provide farmers with an innovative solution to acid soil and will help improve the livelihoods of people across the globe, it also provides investors with a golden opportunity to invest in an eco-friendly, socially aware startup.

BUSINESS VISION

PROBLEM

In the status quo, the modern consumer desires more food than ever before. The ballooning population of Earth leads to a greater demand for food, and in turn puts a larger strain on farmers and their farmland to grow their product in a better way. Many problems relating to farmers and food production have already been solved; for example, companies are developing higher-yield crops, and modifying plants and seeds to include more nutrients and to grow faster. Farmers now have access to more and more information about the upcoming weather patterns, as well as more efficient equipment to plant, harvest, and sell their crops more efficiently. Yet none of these myriad innovations serve any purpose if the ground upon which farmers grow their crops is unusable. This is the problem we want to resolve with our innovative product. High acidity levels in the soil can lead to the destruction of crops and ruin livelihoods. According to a study by the New South Wales Government, acid soils cause \$189 million dollars in damage every year. Further, the only current solution on the market (lime treatment) can be prohibitively expensive, forcing some farmers to abandon entire swaths of land.

COMPANY VISION

TerraBacter works to see a world where farmers can farm their all of land productively without the worry of acid soil. Today, farmers constantly worry that they will not have enough money or food to feed their families, and TerraBacter will see to it that these poor farmers will no longer have to continue to worry.

MISSION STATEMENT

TerraBacter's mission is to provide an alternative, eco-friendly bioremediation technique to efficiently lower the acidity level of soil, enabling farmers to grow crops in a cost-effective manner.

PRODUCTS AND SERVICES

PRODUCT

Using a natural microbe named *Geobacter metallireducens* found in the Potomac River, TerraBacter will increase the pH of soil (hence reducing the acidity) by eliminating harmful aluminum ions. The aluminum ions the microbe targets are electron acceptors, making them dangerous Brønsted-Lowry acids that can block the calcium ion channels plants use in their active transport of nutrients. As a result, the plants experience chlorosis, turn yellow, and wither away. However, once the microbes are simply placed into the soil, they catalyze a reduction-oxidation reaction with the aluminum ions, that converts the ions into non-toxic, solid, plant-friendly aluminum metal. Then, the plants are free to continue their uptake of nutrients through the now unblocked calcium channels.

SUPPLIERS

The University of Massachusetts at Amherst and the Geobacter Project jointly hold the patents on the particular strain of bacteria we plan to use. However, we have reached out to the researcher in charge of the Geobacter project and a professor at Amherst, and they have agreed to a licensing agreement with our company. These organizations will be our primary suppliers for the microbe itself.

The microbe also requires a specific growth factor that it can bind to, increasing duplication and the speed of the reduction reaction. This growth factor consists of a buffer solution of dilute acetic acid and powdered sodium acetate. We plan to get these materials from the Wuxi Unisen Shanghai Corporation, which supplies laboratory-grade sodium acetate and acetic acid.

MANUFACTURING

TerraBacter is created in a 3 step process. First, after an order has been confirmed, the closest lab to this order will start growing the microbe to fill the order size. Second, the growth factor will be added to the microbe's container to act as a substrate and increase the growth speed of the microbe. Third, the container will pass into an incubation oven, where the microbe and substrate will rest at a temperature of approximately 40 C to produce the ideal growing conditions. Lastly, the container will be sent to an international or local mailing company that will send the product to the customer.

FINANCIAL MANAGEMENT

TerraBacter provides an excellent source of revenue in the primary business years of the company and expresses an extravagant source of income within the first 5 years. TerraBacter provides multiple revenue-based scenarios. The first is developed in pricing. Research and analysis shows the target customers (both farmers and farmers' unions) each have around the same willingness to pay \$150-200 for a product of this nature. Calculated pricing allows TerraBacter to maximize profit, marginalize area for future pricing growth, and achieve full customer price satisfaction in relation to competitors.

TerraBacter will utilize a fill rate planning model to allow the company to achieve a more specific planning process within the first few years of operation. Planning is based on analysis of committed order and customer validation rates in the markets.

Start-up costs for TerraBacter are relatively low. We require only \$750,000 of investment to initially set up and begin our business. These finances will be used to cover licensing, manufacturing, legal fees, employee salaries, initial inventory, and marketing (See Appendix A for cost breakdown).

START-UP/ACQUISITION SUMMARY

In the first year, TerraBacter predicts a loss of \$135,500. TerraBacter requires \$750,000 dollars for initial costs of product material, transport expenses (in four target markets), packaging and distribution, research set up, and patent costs to produce and market the bioremediation product. The bulk of the startup costs consists of obtaining stock acetate growth factor to accelerate microbe growth (\$32,880.00) and marketing in the target regions (\$60,000.00). Once production begins, another \$156,600.46 will be needed to fund the price of manufacturing the soil application package. A simple break down has been provided below. An exact break down is provided in Appendix A.

To acquire the \$750,000 needed to start-up TerraBacter, the company will pitch to angel investors and VCs until the appropriate funds are collected. Investors can expect a 180% ROI after the third year of operations.

MARKETING

MARKET ANALYSIS

TerraBacter is targeting four main markets; Sub-Saharan Africa, Northeastern South America, South East Asia, and Coastal Australia.

People within this region already experience tiresome labor from current existing land remediation techniques. Anybody that needs a better solution for agricultural purposes will benefit from using TerraBacter. TerraBacter will work to replace the costly lime treatment already sold in the market. We will reach our customers using farmers' unions around the world as well as our personalized website as distribution channels.

Farmers' unions are collaborative groups of agriculturally oriented people. Within farmers' unions, farmers can learn about new products helpful for them or find out about new laws regarding them or even just help bring name recognition to their farm. We will get our product into these farmers' unions and gain free advertising in a specified region as well as cheaper transportation costs to us. We believe farmer's unions will also benefit from providing our cutting-edge technology to their constituent members We will target the four regions using this model, as well as selling directly to the farmers themselves.

TerraBacter will reach Sub-Saharan Africa, the breadbasket of Africa, and North Eastern South America, one of the richest tropical savannas in the world. TerraBacter will also work to market to South East Asia through partnerships with Farmers' unions. Finally, TerraBacter will also market to Coastal Australia, where the New South Wales government has estimated 189 million dollars in damage from acid soils.

These markets are relatively constant as our product must be reapplied ever year and as there will be acidic soils as long as there is urbanization. Acidic soils are caused by external sources, like acid rain or excess rainwater leachage. Although these markets are diverse in topography we plan on reaching them by placing tolling laboratories located in an ideal spot, one in each region. Overall, our total market value is over 13 billion dollars.

SWOT ANALYSIS

STRENGTHS

TerraBacter has four major strengths. The first strength is our exclusive licensing agreement with University of Massachusetts Amherst saying that we can use the bacteria for our business. Because this licensing agreement is both exclusive and long-term, we have a distinct advantage over any competitors who would plan to steal our idea. Our second strength is the uniqueness of our product. This is the first product developed that fixes acid soil issues for longer than eight months. Our product also costs almost half the price of our competitors and lasts up to twice as long. Finally, TerraBacter is 100% environmentally friendly, not causing harm to plants or animals when it is placed in the soil.

WEAKNESSES

Our major weakness is the lack of presence. Unlike lime treatment, TerraBacter does not have a strong market presence as we are a brand-new company, but in a few years, we hope that the our reputation will spread resolving this issue. Another weakness is the potential of transportation mishaps, which could cause losses. Because of the nature of the areas in which we plan to market our product, this isn't an issue that is easily resolved. Beyond the initial steps of contracting to experienced trucking companies to ensure rapid and safe delivery, our product has a profit margin over 100%, enabling us to still make a profit even if our first shipment has a transportation issue.

OPPORTUNITIES

As we continue to grow, opportunities will arise. For one, as technology improves, we can continue to research the bacteria and make the product more efficient. Also, we plan to approach the UN and EU down the road, to partner with them to spread the word about our product more efficiently. Finally, we plan to expand our market from the initial four regions to more areas around the world where acid soils are a major problem - for example, the Southern United States, or Western Europe.

THREATS

Our only major threat is bad weather and natural disasters. Because they are uncontrollable, and can devastate the agricultural sector of an entire region, there is not much we can do to prevent these calamities. Of course, if such a thing were to happen, we would naturally lose sales. However, we sell to four distinct regions of the world. Our rationale behind marketing to so many regions is that, if a natural disaster were to strike one region, we would only lose a quarter of our market, instead of incurring total losses.

COMPETITION

LIME TREATMENTS

Because there has been no other real solution to the issue of acid soil, lime treatment companies have dominated the market. What they do is go around fields in giant machines and dump lime (powdered or pelletized calcium carbonate) into the soil, making it less acidic. Calcium carbonate reacts with the excess trivalent aluminum and monoprotic acids in the soil to neutralize or nullify the harmful effects of acid in the soil. However, the problem is this process is expensive, time consuming, and does not last a long period of time. To be more specific, Lime treatment on average costs over \$240 per acre, but only lasts 6 months. Now compare this to our product. TerraBacter is placed in soil through the watering systems of farms, and does not need bulky, expensive machinery. We also charge only \$150 per acre instead of \$240 like lime treatment. TerraBacter also stays in the ground for 12 months, keeping the soil less acidic for a longer period of time. This makes the TerraBacter product almost 40% cheaper than lime treatment and twice as efficient.

SALES STRATEGY

PRICING

TerraBacter has been priced in accordance with the value of the product to potential customers. Our pricing works in accordance to the acres of the farmer's land. In this way we can accommodate any size farm because our pricing is based on acres. On our end, it will cost us \$60 per acre to produce the product. The cost of the growth factor to stimulate reproduce the bacteria in our labs is \$32 per acre. Our licensing deal with UMass-Amherst and the Geobacter Project will cost us approximately \$2 per acre. The tolling to the four tolling labs in each respective market areas will cost \$8. Transporting to the areas of the unions and farmers will cost \$16 per acre. Marketing the product and building a name behind our company will cost \$2 per acre.

We are pricing our product at \$150. This is a 150% profit margin for our product. This is cheaper than our competitor, lime treatment, which is priced at \$240. We priced our product at this rate because we believe that our product will save the farmers enough of their crops from dying that their economic gains will outweigh the cost of our product.

The price of TerraBacter will increase according to the slow increase in demand. This increase will take years, as the demand cannot increase much until brand validation. With current projections, TerraBacter will make a loss of \$135,500 in the first year.

TerraBacter will constantly change as innovations and discoveries are made in the field. Gauging the price changes and product demand, constantly researching additional ways to improve efficiency and lower cost, and increased formation partnerships to sell in bulk are only a few of strategies TerraBacter plans to implement to stay on top of the field.

ADVERTISING AND PROMOTION

We hope to initially start advertising through farmers' unions. They will provide our product to the farmers that ordered it. After they have seen the effectiveness of the product, we hope that the product will then spread by word of mouth, which will eventually snowball. We will also have a website devoted to the product so that farmers which are not inside a union can purchase the product. Finally, we've set up numerous social media accounts, including a Facebook page, on which farmers and unions can learn about our product.

STRATEGY AND IMPLEMENTATION

Our company strategy is broken into three stages. Stage 1 includes the setting up of tolling labs, initial transportation costs, initial marketing, and initial growth in labs. Stage 2 includes the setting up of a research and development facility for further testing and increase in productivity. The main idea for this stage is to be able to increase productivity. Stage 3 is the continuation of product research and development as well as continuation of profit by marketing towards commercial farms within the US and European Countries.

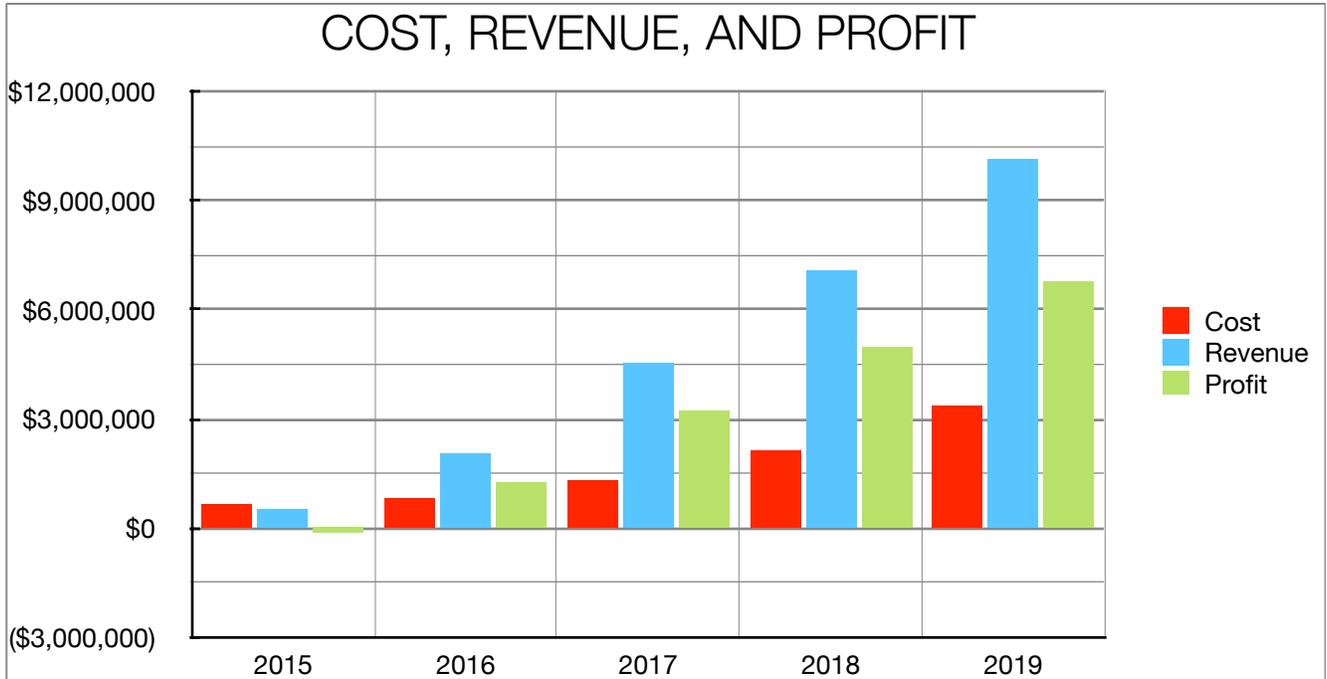
In Stage 1, we will set up labs in our four market areas: Northeastern South America, Sub-Saharan Africa, Coastal Australia, and Southeast Asia. We will ship four samples of the bacteria to each of the labs. These labs will then cultivate the bacteria and grow at a rapid rate to meet the orders of the unions and the farmers. We will then set up transportation with trucks and planes to ship to the orders to the unions and the farmers. We will set up social media outlets such as emails, Facebook pages, and Twitter pages. We will advertise through our website as well, slowly gaining us more and more exposure.

In Stage 2, we will set up research labs in the United States in order to further research ways to improve the bacteria's biochemical structure. We aim to make the bacteria more efficient in reducing the acidity of the soil. This will reduce the amount of bacteria needed in quantity per acre lowering the cost of production.

In Stage 3, we will continue our product research aiming to make the bacteria more efficient as previously stated and develop to the UN and EU. These organizations will help our product become more prominent as an agricultural product. With their connections, the UN and EU will help our product be widely used by farmers who may not have a chance to purchase our product. We will also be expanding our markets to include farmers and farmers' unions in the US and in European countries as well.

At this point, the company will have a growing customer base and will be able to develop a stronger cash flow. The continued sale of the microbes will allow for a steady inflow of money to the company reserves.

From here, TerraBacter will grow the company for the next few years, finally penetrating larger consumer markets by selling the product through distribution channels such as UN and EU for poorer farmers.



FUTURE EARNINGS PROJECTIONS

TerraBacter’s revenue will grow steadily at a near constant rate over time, as shown in the chart above.

TerraBacter will record a loss in its first year of existence; however, from the second year onwards, we project that the company will become a profitable business. The company will make \$3,245,600 in its third year. TerraBacter’s future earnings increase at a steady rate and are sustainable. This opens the door for growth and more revenue.

OPERATIONAL PLAN

RESEARCH AND DEVELOPMENT

TerraBacter has a long-term exclusive licensing agreement with UMass-Amherst and the Geobacter Project. No other company has the right to do what we are doing. TerraBacter will be investing sums of money into a research and development team. They will be tasked with engineering the bacteria to be more efficient i.e. last for a longer period of time with a cheaper production cost.

LOCATION

TerraBacter development labs will be located in all of the target markets including Sub-Saharan Africa, Northeastern South America, Southeast Asia, and Coastal Australia. During Stages 2-3, we plan to open a Research and Development laboratory somewhere in the United States, most likely in the Atlanta area.

COMPANY OWNERSHIP/LEGAL ENTITY

TerraBacter is structured as a partnership with all seven partners holding equal shares. Investors will hold a combined share of 20% of the company in return for the \$750,000 required for startup costs. TerraBacter is also structured as a LLC (Limited Liability Corporation), to minimize the risk of liability in case of improper application by farmers or freak accidents over which the TerraBacter team has no control.

EXIT STRATEGY

Due to the innovative nature of this product, we expect to see similar bioremediation companies popping up within 10-15 years. During this time period, we plan to sell to our competitors, if necessary.

APPENDIX

A: STARTUP EXPENSES

ITEM	COST
Register Capital	\$6,880.54
Export License (4 Markets)	\$32,468.00
Manufacturing License	\$10,872.00
Licensing Costs	\$40,000.00
Payment to Union	\$8,000.16
Lab Tolling (4 Target Markets)	\$100,000.48
Local Transport Expense (4 Target Markets)	\$8,400.50
Marketing Expense	\$60,000.00
Insurance (annual)	\$5,000.00
Payroll	\$172,836.00
Initial Acetate Growth Factor Stock	\$32,880.00
Lawyer Fees	\$24,052.00
Soil Application Package	\$156,600.46
Farmer Revenue Sharing	\$2,500.00
TOTAL STARTUP EXPENSES	\$660,400.85

B: INCOME STATEMENT

For the Years Ending Dec 31, 2015 and Dec 31, 2016

Revenue	2014	2015
Sales revenue	525,000	2,070,000
Total Revenues	\$525,000	\$2,070,000
Expenses		
Register Capital	\$6,880.54	
Export License (4 Markets)	\$32,468.00	
Manufacturing License	\$10,872.00	
Licensing Costs	\$40,000.00	\$40,000.00
Payment to Union	\$8,000.16	\$20,800.16
Lab Tolling (4 Target Markets)	\$100,000.48	\$100,000.48
Local Transport Expense (4 Target Markets)	\$8,400.50	\$8,400.50
Marketing Expense	\$60,000.00	\$150,000.00
Insurance (annual)	\$5,000.00	\$5,000.00
Payroll	\$172,836.00	\$172,836.00
Initial Acetate Growth Factor Stock	\$32,880.00	\$64,800.00
Lawyer Fees (South America)	\$2,902.11	\$2,902.11
Lawyer Fees (SE Asia)	\$8,750.00	\$8,750.00
Lawyer Fees (Coastal Australia)	\$12,400.00	\$12,400.00
Product Manufacturing	\$156,600.46	\$246,600.46
Farmer Revenue Sharing	\$2,500.00	\$12,000.00
Total Expenses	\$ 660,401.00	\$ 821,654.00
Net Income Before Taxes	\$ (135,500.00)	\$ 1,248,346.00
Income tax expense	\$ 15,235.00	\$ 137,318.00
Net Income	\$ (150,735.00)	\$ 1,111,028.00