FERTILOCK SUMMARY

FertiLock is the key to transforming the existing fertilizer industry.

FertiLock's unique, newly patented technology transforms industry-standard fertilizers into Enhanced Efficiency Fertilizers (EEF). Currently referred to as FertiLock Basic (or the Product), the primary purpose is to enhance fertilizer utilization by dramatically reducing fertilizer losses to the environment from runoff and volatilization. Additionally, FertiLock Basic uses ***fertilizer as a delivery platform*** for multiple farming inputs.

FertiLock Basic is created by encapsulating conventional fertilizer with (in layperson's terms) a glue/barrier (GB) and then coating/impregnating the fertilizer with a mixture of liquid humates and microbes. The Product is designed to encapsulate the fertilizer particles in such a manner as to prevent volatilization and nutrient runoff. Volatilization and runoff ***can waste up to 50+% of all fertilizers applied*** in the field (varies widely, depending on a range of factors). ***FertiLock Basic achieves this fertilizer usage reduction without decreasing crop yields.***

The economic benefits of reducing fertilizer usage by up to 50+% are obvious. In addition to purchasing less fertilizer (even at a higher cost), transportation and storage costs are also correspondingly reduced. These factors combine to ***increase the profitability of the farmer***.

The environmental impact is significant as FertiLock Basic will dramatically reduce Greenhouse Gas (GHG) Emissions and the creation/enlargement of "dead zones" in bodies of water. Due to the reduction in traditional fertilizer usage and the negation of its ill effects, FertiLock Basic users should also qualify for any benefits related to carbon credits.

A larger quantity of organic microbes can further enhance FertiLock Basic, increasing Nutrient Use Efficiency (NUE) in plants. This combination is ***documented in numerous field trials by credible third parties to increase crop yields by 10-20+%.*** This Product is called FertiLock High Yield.

FertiLock Basic and FertiLock High Yield is currently patent pending and has been “allowed” for a U.S. patent. FertiLock has applied for patent protection for this technology in over 150 countries. The current patent covers traditional Nitrogen – Phosphorous – Potassium (NPK) formulations and plant micronutrients such as boron, manganese, zinc, and iron.

Most importantly, from a marketing point of view, FertiLock products do not require any change in behavior by farmers, nor does FertiLock require any meaningful change in the fertilizer supply chain. It is just one additional step in the fertilizer blending process, and then ***FertiLock will fit into existing industry norms from distribution to sales to application.***

Fertilizer is responsible for 50% of crop yields; hence, it has a critical role in the world's food security and availability. In today's market, a confluence of factors has negatively impacted global fertilizer markets. These challenges have constrained supply and increased the farmers' price for this essential crop input. It is hard to conceive of a better time to introduce an EEF such as FertiLock.

Efficacy and Science of FertiLock

The Association of American Plant Food Control Officials (AAPFCO) defines Enhanced Efficiency Fertilizers (EEFs) as fertilizer products that can reduce nutrient losses to the environment while increasing nutrient availability for the plant or the crop. These fertilizers can either slow the release of nutrients for uptake or alter the conversion of nutrients to other forms that may be less susceptible to losses.
FertiLock does both.

Here are two representative field trials using FertiLock Basic conducted at the Mississippi State Research Station in Beaumont, Mississippi, between November 2021 and May 2022.

Ryegrass

Treatment	**Pounds/acre of ryegrass**	**Change compared to Grower Standard**
Fertilock Basic treated fertilizer with a ***20% reduction*** in fertilizer compared to Grower Standard	22,041	**+13.6% Increase in Yield**
Grower Standard	19,405	

Wheat

Treatment	**Pounds/acre of wheat**	**Change compared to Grower Standard**
Fertilock Basic treated fertilizer with a ***25% reduction*** in fertilizer compared to Grower Standard	14,815	**+21.3% Increase in Yield**
Grower Standard	12,218	

Below is a trial conducted by Dr. Randy Smith on a private farm in Simpson County, Mississippi between June and October 2021 using FertiLock High Yield.

Soybeans

Treatment	**Pounds/acre of soybeans**	**Change compared to Grower Standard**
Fertilock High Yield with a ***50% reduction*** in fertilizer compared to Grower Standard applied ***in a single application***	12,477.74	**+30.9% Increase in Yield**
Fertilock High Yield with a ***50% reduction*** in fertilizer compared to Grower Standard ***applied in two applications***	13,873.97	**+45.6% Increase in Yield**
Grower Standard	9,530.94	

These trials show that even with reductions in fertilizer, there are still significant increases in yield compared to grower standard. There are numerous variables in the field when conducting trials; however, these trials show that ***fertilizer can be reduced with a positive impact on yield coupled with the other benefits mentioned above.***

Many other trials show fertilizer reductions of up to 50%, where there was still a yield increase when the fertilizer and microbial mixture were applied separately. We have no reason to believe the combination of fertilizer, GB, and the microbial mixture will produce statistically different results.

The FertiLock process creates its EEF by encapsulating conventional fertilizer with a GB and then coating/impregnating the fertilizer with a mixture of liquid humates and microbes. The Product is designed to encapsulate fertilizer particles in such a manner as to prevent volatilization and nutrient runoff ***without any reduction in the benefits of using fertilizer***.

For the fertilizer which remains in situ, the FertiLock process increases the NUE by the plant. This NUE increase and the added biological inputs increase crop yields compared to the grower standard using conventional fertilizer.

Patent Protection Supporting Marketing

On August 18, 2022, FertiLock received notice that our patent application has been "allowed" – the stage in the patent process between approval and actual issuance of a patent -- by the United States Patent and Trademark Office (USPTO). ***The FertiLock patent application was "allowed" on its first patent review, which occurs in less than 3% of all patent applications***. The patent covers FertiLock Basic and FertiLock High Yield since both products entail biological additives to fertilizer.

The delivery platform aspect is the foundational piece of a larger plan. FertiLock has additional platform additives under development -- agricultural inputs which can be delivered via fertilizer. The existing patent application protects their use.

Imagine a pie sliced into serving pieces. Most patents are trying to fit into the knife cut between two pieces of pie due to competing patents against many other patents already issued. For example, there are over 1000 issued patents covering *seed* coatings. The FertiLock patent application is for an entire slice of the pie. It encompasses a broad range of possibilities since there is so little patent activity in *fertilizer* coatings, which is one of the reasons the patent was "allowed" on the first review.

Additions to existing patented technology can only be commercially used with the legal ability to use the underlying technology in a foundational patent. For example, the legal ability to commercially market a patent for a four-legged chair must be obtained from the patent holder of a three-legged stool. Seat backs and armrests would also be considered *additions* to a three-legged stool patent.

The only way around a patent on a three-legged stool would be *subtracting* something, so a two-legged stool could be commercially marketed without legal permission to use the three-legged stool patent. Therefore, FertiLock's Intellectual Property (IP) portfolio should protect FertiLock's position as the global leader in this field due to its foundational technology.

In many organizations, inventors develop patents around the new "cool" technology they have discovered. FertiLock's approach was to create IP to support the strategic business goals of the fertilizer industry and our company, specifically enabling additional sales of an existing product and enhancing the profits of farmers and fertilizer industry participants. The IP, consisting of one allowed patent, with other additions to this foundational patent under development and codified trade secrets, is a strong, resilient IP portfolio. ***There is a clear linkage between the IP portfolio to the market opportunities***.

The FertiLock Basic product has three components -- traditional fertilizer, the GB, and a microbial mixture carried by liquid humates. As a standalone product, the microbial mixture has been successfully used on over 100 crops in over 40 countries, covering various soils, weather conditions, and stressors. Numerous trials were conducted by governmental bodies, universities, and independent testing facilities; however, customers have been reluctant to order product without conducting their trials because the product suffers from an embarrassment of riches (too many benefits).

Agricultural biological (containing microbes) products have faced multiple barriers to entry, specifically including:

1. It is a relatively new product for the end users.
2. The unique selling proposition benefits of reduced fertilizer usage and increased yields are perceived to be mutually exclusive by prospective buyers.
3. Using a liquid biological requires a behavioral change by some end users (liquid vs. granular, or frequently a separate application).
4. The preferred sales channel using existing fertilizer distributors is difficult to penetrate since fertilizer distributors are hesitant at best and antagonistic at worst to the idea of selling biologicals. Using biologicals typically requires a reduction in fertilizer usage.

These difficulties necessitated going from farmer to farmer to make sales. Then, due to the multiple benefits of biologicals, the product has been viewed as "too good to be true." As a result, sales typically required a demonstration trial for the farmer before purchasing in quantity.

The FertiLock Basic platform solves these marketing issues. The initial message of an EEF to control environmental losses of fertilizer is a significantly more believable (and focused) message. The expected platform additives will focus on a specific benefit, such as the previously mentioned FertiLock High Yield, featuring yield increases. Additionally, there will be additives for insect and disease control, and water efficiency/reduction in compaction, among other benefits. We expect the FertiLock product line to be marketed through existing distribution channels without changing current industry norms. Distributing through this channel will surely shift the marketplace acceptance of biological products.

Carbon Credits

A carbon credit is a generic term for any tradable certificate or permit representing the right to emit a set amount of carbon dioxide (CO2) or the equivalent amount of different greenhouse

gases. Carbon credits and carbon markets are a component of national and international attempt to mitigate the growth in concentrations of greenhouse gases.

The underlying theory is simple. If one party cannot stop emitting CO_2, it can ask another party to emit less so that, even as the first party carries on producing, the total amount of GHG emissions in the atmosphere is reduced.

Carbon credits are generated when businesses and entrepreneurs engage in activities that reduce the release of GHGs, such as reducing the amount of fertilizer used by a farmer or enhancing the fertilizer to reduce volatilization and runoff. In the United States, agriculture accounts for almost 70 percent of all nitrous oxide (N_2O) emissions linked with human activity. Nitrous oxide is one of the major gases contributing to human-induced climate change. In addition, a molecule of N_2O has more than 300 times the heat-trapping effect in the atmosphere as a molecule of CO_2.

In soils, producing N_2O through microbial activity is a natural process. However, by applying copious amounts of fertilizer, humans have greatly increased the amount of N_2O in soils. This is particularly true when nitrogen fertilizer is added in larger quantities than the crop needs and when fertilizer is applied at times or in ways that make it difficult for the crop to get the full benefit.

Potential carbon credits must be documented or certified as representing a stated quantity of reduced or avoided carbon emissions before they can be approved to offset regulated carbon emissions.

Phil Robertson, a scientist at Michigan State University and principal investigator at the National Science Foundation's (NSF) Kellogg Biological Station (KBS) Long-Term Ecological Research (LTER) site, states, "***Improving the efficiency of nitrogen use for field crop agriculture holds great promise for helping mitigate climate change***."

Robertson and colleagues are putting the final changes on a program that would pay farmers to apply less nitrogen fertilizer in a way that does not jeopardize yields. The program, called the nitrous oxide greenhouse gas reduction methodology, is in partnership with the Electric Power Research Institute.

The nitrous oxide greenhouse gas reduction methodology, a way for farmers to participate in existing and emerging carbon markets, was recently approved by the American Carbon Registry. It is in its final stages of validation by the Verified Carbon Standard. These are two global carbon market standards.

When farmers reduce their nitrogen fertilizer use, they can use the methodology to generate carbon credits. Farmers can sell these credits in carbon markets for financial payments.

The scientific underpinning for the methodology rests on decades of research Robertson, and colleagues have conducted at the KBS LTER site.

Environmental Impact

Farmers already manage fertilizer to avoid large losses; however, once nitrogen fertilizer hits the ground, it is hard to contain and is easily lost to groundwater, rivers, oceans, and the atmosphere. It currently costs more money to reduce fertilizer losses than fertilizer reduction saves. Nitrogen lost to the environment from agricultural fields is nitrogen not used by crops**.**

The loss of nitrogenous compounds to the atmosphere and runoff is wasteful and environmentally damaging. There is a saying, "don't complain about farmers with your mouth full." ***Fertilizer has been unavoidable***, so it is difficult to fault fertilizer users (or the companies providing fertilizer); however, now there is a way to make fertilizer less harmful to the environment ***without any negative impact on yield*** -- FertiLock.

The factors which affect volatilization are many, complex, and unpredictable. Factors affecting losses include temperature, soil texture, pH, moisture, and amount of surface residue, to name a few. There is no finite answer, and losses can begin to occur immediately. For example, studies show that losses can be as high as 46% after five days when temperatures are 77 degrees F and as low as 7% after five days when temperatures are 59 degrees F. Volatilization losses double from 10% to 20% after four days when pH increases from 6.5 to 7.5.

According to the Cary Institute of Ecosystem Studies, in the Midwestern breadbasket of the U.S., about half of the nitrogen applied is lost to the atmosphere as ammonia gas (NH_3) and nitrous oxide (N_2O) and runoff.

All ammonium and ammonia-based fertilizers, including manure, have the potential for ammonia volatilization - the loss of nitrogen (N) to the air as ammonia gas. Our focus is on ammonia volatilization (referred to herein as simply volatilization) from urea and liquids containing urea, such as urea ammonium nitrate (UAN), because urea fertilizers have the greatest potential for volatilization.

Volatilization reduces the economic efficiency of agricultural cropping systems. Either volatilization will reduce yields, or farmers will incur additional costs from applying nitrogen fertilizer, which is not used by the crop.

Excess nitrogen can cause overstimulation of the growth of aquatic plants and algae. Excessive growth of these organisms, in turn, can clog water intakes, use up dissolved oxygen as they decompose, and block light to deeper waters. Lake and reservoir eutrophication can occur, producing unsightly scums of algae on the water surface, occasionally resulting in fish kills, and even " killing" a lake by depriving it of oxygen. The respiration efficiency of fish and aquatic invertebrates can occur, decreasing animal and plant diversity.

Hypoxic (oxygen-deprived) zones, commonly referred to as "dead zones," which exist in waterways such as those in the Gulf of Mexico, Chesapeake Bay, and Lake Erie – are expanding as agriculture's chemical fertilizer use continues. Fertilizer is soluble in water, and when the water runs off, it takes the fertilizer with it, causing algae blooms in the waterways. Over time,

these algae blooms consume the available oxygen in the waterway to levels incapable of supporting life.

In the Gulf of Mexico, the Mississippi River functions as a garbage chute, depositing all the waste it accumulates from our heartland in the formerly biodiverse coastal water areas. The lifeless "dead zone" in the Gulf of Mexico is agriculture's biggest ecological albatross in the U.S., although these dead zones exist worldwide primarily where rivers meet oceans. The dead zone at the mouth of the Mississippi River can be as large as 7000 square miles at times (1.84 x 1010 square meters).

When nitrogen and phosphorous fertilizers run into waterways, algae can converge and feast on the buffet of growth-inducing nutrients, causing a freaky type of algae to bloom, referred to as, "Red tides." Scientists prefer the term "harmful algae bloom" since a red tide is not always red, and it is not a tide.

Volatilization and runoff are not the only adverse consequence of chemical fertilizer use. Recent research released by the University of California at Davis has found that chemical fertilizers contaminate the drinking waters in agricultural areas throughout the U.S. with dangerous levels of nitrates.

The study focused on the effects of farms in the Central Valley of California, one of the most prolific agricultural areas in the U.S. The study found that up to 10% of residents living near agricultural areas drink water contaminated with nitrates greater than safe levels. Based on the current rate of chemical fertilizer use, that number is likely to grow to almost 80% by the year 2050.

High nitrate levels in water are associated with the fatal "blue baby" disorder in children, rashes, congenital disabilities, hair loss, and thyroid cancer. Nitrates are not readily recognized in drinking water and are silent destructors. They have no taste or odor and can only be determined using a water testing lab.
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A Perfect Storm in Fertilizer

Fertilizer is a globally traded commodity influenced by global supply and demand factors and domestic conditions. ***Fertilizer is resource-dependent relying on natural gas*** to make nitrogen and mineral deposits of potash and phosphate. There are issues with the availability and price of the primary feedstock in fertilizer production and distribution. These issues are causing fertilizer prices to rise, and as fertilizer prices rise, so does the selling price of the crops, so food prices have increased dramatically.

Fertilizer is one of the key components in the global agricultural system. ***Fertilizers are a relatively small cost component in agriculture and cannot be avoided.*** Nitrogen-based fertilizers account for approximately 60% of all fertilizers used in the U.S. The cost of nitrogen is determined by the cost of feedstock, which is natural gas for almost all nitrogen-producing

fertilizer plants. The price of nitrogenous fertilizers is highly correlated with natural gas since so much natural gas goes into production. Other forms of fertilizer have their issues.

Natural gas is a key source of fertilizers in the form of ammonia and urea. Ammonia is the building block of all nitrogen fertilizers. Different hydrocarbon feedstocks, such as natural gas, coal, and oil, can produce ammonia; however, natural gas accounts for more than 95% of ammonia tonnage. Ammonia is also needed as part of the production process for phosphate fertilizers.

Natural gas is the preferred feedstock primarily because it is intrinsically the most hydrogen-rich and, therefore, contributes more hydrogen than other feedstocks on a unit-weight basis. The heavier feedstocks, like coal and oil, are more complex to process; therefore, the capital costs are higher than natural gas.

Natural gas performs two functions in the production of fertilizer. Natural gas is first combined with atmospheric nitrogen to create ammonia when making nitrogen-based fertilizers. Natural gas is also used to generate the heat needed for conversion. ***Natural gas, depending on price, accounts for 70% to 90% of the total ammonia production costs***, with 40% of gas used as fuel and 60% as feedstock.

Therefore, natural gas supply and demand play a critical role in determining nitrogen-based fertilizer prices. When reserves are tight, prices rise dramatically. Natural gas prices are way up, so fertilizer prices have significantly increased.

There is a severe shortage of natural gas in the EU. The lack of natural gas is already affecting the EU. Natural gas is being directed toward consumers rather than manufacturing facilities, which will cause additional fertilizer shortages and, therefore, higher prices. The price has exploded upward. When available, in parts of the EU, prices have exceeded $50/Million British Thermal Units (MMBTUs). Two years ago, natural gas prices in the U.S. were under $1.50/MMBTU. U.S. prices have recently been in the $6-8/MMBTU range.

Since natural gas prices are currently high, it is important to note that between 2003-2008, high U.S. natural gas costs were a major driver of U.S. nitrogen production reductions and bankruptcies. During that period, ammonia producers reduced production facilities from 37 to 22.

Fertilizer prices were soaring due to weather and supply chain shocks, exacerbated by the COVID-19 pandemic before Russia invaded Ukraine. While the war in Ukraine further constrains global fertilizer markets, it is important to note that numerous geopolitical and supply chain challenges were already present before Russia's invasion. The compilation of these underlying factors continues to be the primary stress point in the global fertilizer business.

Because the fertilizer industry is globally intertwined, supply disruptions caused by increasing energy prices, foreign trade policies, and geopolitical events (Belarus, China, Russia/Ukraine) can adversely impact price and supply conditions in the United States. Consequently, over the last two years, these events have resulted in substantial fertilizer input cost increases.

Belarus represents 21% of the global supply of potash. Sanctions levied upon Belarus have reduced the world's potash supply by approximately one-fifth.

China's October 2021 export ban on phosphate fertilizer and some nitrogen fertilizers continues to pressure the global fertilizer business by limiting supply availability outside China. China accounted for 25% of global processed phosphate exports and 10% of urea exports in 2020.

China has historically been the largest producer of phosphate and nitrogen fertilizers. China consumes much of this production, and China has traditionally also been a top product exporter. Its self-imposed export ban has drastically reduced the global supply of these essential crop nutrients.

Russia set six-month quotas (not a full ban) on some nitrogen and phosphate fertilizers exports in November 2021. Many nations have levied sanctions against Russia, making fertilizer exports from the country exceedingly difficult. In 2020, Russia accounted for 10% of global phosphate exports, 23% of ammonia, and 14% of urea.

Supply disruptions from Russia and Eastern Europe due to the Ukraine war impact fertilizer supply. Earlier this summer, Bloomberg reported that a quarter of Europe's nitrogen fertilizer capacity was curtailed. And since then, Russia has cut off the Nord Stream 1 pipeline to Europe, which supplies 45% of Europe's natural gas imports, and the Nord Stream 2 pipeline is now inoperable. This lack of supply will have a knock-on effect on fertilizer production.

Freight delivery is another well-publicized issue. Fertilizer is a bulky, heavy product shipped great distances by several modes, including railroads, ocean tankers, river barges, and trucks. They all run on petroleum products, and the current high oil prices further increase fertilizer transportation costs.

More than half of all fertilizer moves by rail. Regarding rail delivery, the economics have been getting worse for decades. Over the past 20 years, rail rates to ship anhydrous ammonia have increased by 206%, which is more than triple the average increase for all commodities combined.

Beyond rail rates, disruptions in rail service have limited the ability to move fertilizer. Rail carrier cycle times have been in a downward trend, with no apparent reversal soon. The industry cannot ship as much fertilizer in the same timeframe, which negatively impacts domestic production and blending facilities with limited site storage. This matter is well articulated in an opinion editorial published in May 2022.

News media reports of supply chain issues have focused on ocean freight, which is certainly an issue that does not require further detail here.

Droughts have lowered water levels in rivers making many of them unpassable for barge traffic, such as the Mississippi River, where parts of it are below the minimum nine feet of water necessary for a barge.

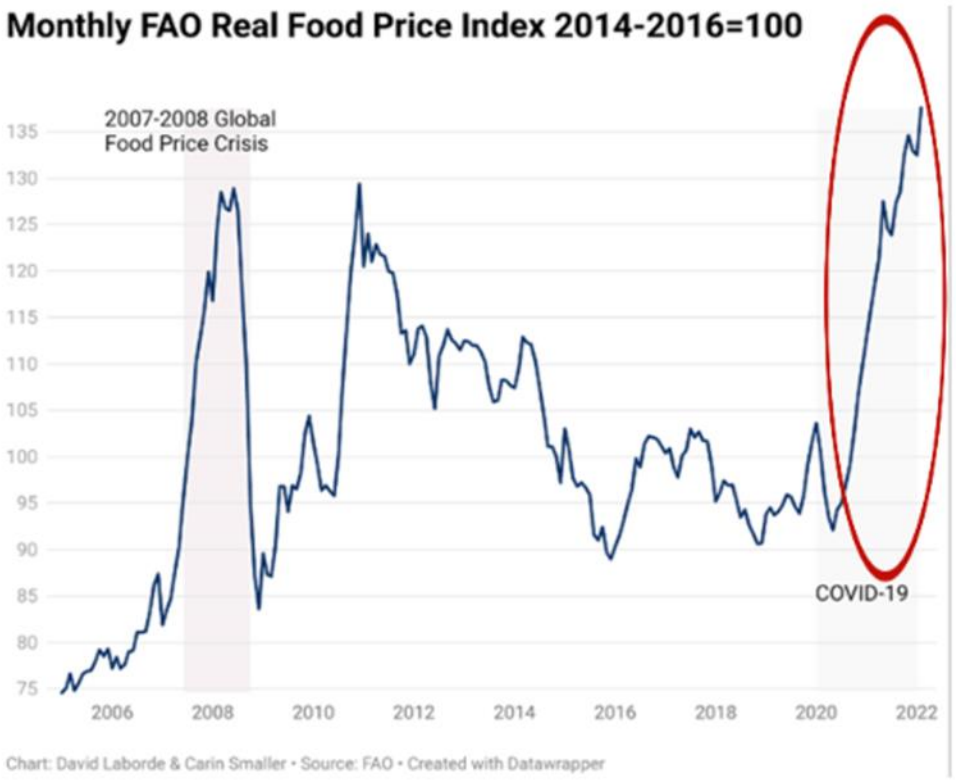
Other rivers have greatly reduced capacity, such as the Rhine River in Germany, where container vessels can only carry 20% of a standard load due to the low water level.

There have been COVID-related truck driver shortages, and now diesel fuel supplies are running dangerously low in the U.S.

Food Security

Higher natural gas prices and higher freight delivery costs increase the cost of fertilizer. As the cost of fertilizer increases, so does the food price.

Food prices are rising at a higher rate than the headline rate of inflation, which is at the highest level in 40 years. For instance, the price of wheat — a key ingredient of food staples -- is up almost 100% in the past 18 months. As shown in the chart below, the overall price of food products worldwide is up 42% this past year:



It will be difficult for Russia to continue exporting wheat up to its past levels, with global sanctions choking off trade and damaging some of its ports.

Reporting states that one-third of Ukraine's farmlands may not be harvested or cultivated this year.

According to the New York Times, the war "has also reached deep into the fertile plains of a region known as Europe's breadbasket, paralyzing harvests, destroying granaries and crops, and bringing potentially devastating consequences to a country that produces a large share of the world's grain."

Market Opportunity

FertiLock is seeking partners to bring this timely Product to market.

Summary

FertiLock has a propriety, protected product that has the potential to disrupt the fertilizer industry, with a market size of more than $100 billion/year. Fertilizer is a crucial input in the worldwide agriculture industry. A planned product line extension under development will increase the total addressable market.

The Product will easily fit into industry norms without disrupting existing sales, marketing, manufacturing, or distribution models, nor will it require any change from end users.

The overabundance of certain fertilizer nutrients in the water and the atmosphere can cause many adverse health and ecological effects. FertiLock mitigates several forms of pollution caused by heavy fertilizer usage, including GHG emissions and water pollution, without spending extra money. ***End users may be compensated for using FertiLock products*** via carbon credits.

The timing could not be better, with prices soaring for natural gas, a crucial input in manufacturing fertilizer, and current events affecting the natural gas supply in some regions.

Current events have negatively impacted the ability to transport fertilizer, resulting in high freight prices and uncertainty about the ability to ship present quantities. Reducing fertilizer usage and the amount shipped will only have beneficial second-order effects.

There are no losers with this Product. It is a win-win proposition for all parties involved.

The world needs a solution to the rising cost of fertilizer, the worsening ability to produce and deliver fertilizer, and the health and environmental damage that excessive fertilizer usage causes. Widespread usage of FertiLock will help avoid even higher food prices and the turmoil it will cause. ***We are confident that Fertilock products are the key to solving many problems.***

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