SoilSave Executive Summary

SoilSave

Using cloud computing, AI, and ML for automated soil health analysis

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SoilSave

Our Mission and Purpose: SoilSave provides data-driven soil nutrient solutions to help agricultural growers in the Corn Belt maximize their crop yields.

Industry Analysis and Market Research:

As the global population (8 billion as of November 2022) continues to increase, it is critical that farms can produce more crops to meet the rising demand for food. In addition, the availability of land usable for farming is decreasing year after year. Further, the growing population, water scarcity, and climate change are severely impacting the agricultural land. The agricultural analytics industry aims to optimize crop yield for farmers all across the world. The growing adoption of smart technologies to enable precision agriculture and the increasing adoption of AI and predictive analytics to improve the yield offer significant growth opportunities to companies in the agriculture analytics market. According to a report by Emergen Research, as of 2020, the global agriculture analytics market size is 827.5 million USD. Among regional markets, North American accounts for the largest revenue share contribution to the global market. Presence of major companies and players in the industry such as Deere & Company, IBM, Trimble, Iteris, and Oracle contributes to the strong position of North America in the agriculture analytics market and is expected to boost growth of the North American market in the future.

Cover crops are becoming an increasingly widespread method of combating the issues that arise from soil degradation. From 2012 to 2017, the use of cover crops has increased by 50%. As soil health declines around the world, the government is creating more incentive programs to spur farmers to improve the health of their soil; monitoring soil can be a tedious process for those that participate in this program, which prevents potential participants from entering these programs. Similarly, soil testing is a precise method of soil nutrient measurement for the purpose of carbon credit programs. Farmers can create an additional source of revenue by selling carbon credits to other companies or investors due to the carbon that their plants and soil sequester from the atmosphere. Finally, several corporations, including PepsiCo, Whole Foods, and WalMart are heavily investing in regenerative agriculture.

Business Model:

Revenue Streams	Key Activities	Customer Segments	Customer Relations
One-time purchase for sensors + monthly subscription fee for software	B2B Distribution	Niche market - Farmers who are having a hard time with production using traditional techniques	One-time cost for buying testing device
	R&D for sensors and online software		Basic package, upgraded package, specialized packages available depending on size of farm, level of needs
Quarterly or monthly subscription; savings if purchasing quarterly or yearly subscription	Enhance predictive capabilities of sensors using ML	Midwest growers in areas with poor topsoil; want an easy solution to monitoring land	+5 year warranty on all sensors
Savings on bulk purchases of sensors	Outsource manufacturing		2 month free trial
	Marketing - website, agricultural product showcases		Help call-line and support email to assist with technical issues, use of online software, installation
Packages: 15 sensors (for 450 acres) + 6-month subscription	Agronomists/specialists to give guidance	Younger, environmentally-minded and technologically-savvy farmers	Agronomist guidance to assist with implementing growing plan (addl fee)
	Technicians to inspect faulty/damaged sensors		Foster long-term relationships through dedicated personal assistance

Cost Structure	Key Channels	Key Partners	Key Resources
Cost-driven	Owned direct	Manufacturer for sensor hardware - economies of scale	Software and hardware engineers
Economies of scale	Online retail		Agronomists, researchers
Manufacturing - most expensive	Remote service	Cloud computing company	Lab for product testing
R&D - more expensive	Sales agents		Relationship with manufacturer
	Classified listings		Cash, loans
			Sales representatives
			Support personnel Technicians

Value Proposition:

- "Set it and forget it" all-in-one soil testing.
- Cloud computing uploads data readings from sensors to online software in < a day. Sensors provide readings beyond conventional testing (soil compaction, contaminants, moisture)
- AI-generated growing plan; integrates public access data about climate, geography, etc.
  - What kind of cover crops to grow that are best suited for climate conditions and food crops?
  - How long to grow the cover crops for?
  - What equipment, fertilizer, plants are needed to implement the plan?
  - How to employ polyculture and crop rotation given the crops the farmer is already growing and growing land available?
- Machine Learning to increase sensors' predictive capabilities over time
- Cost-effective over time
- More components tested than traditional sampling (soil compaction, contaminants, moisture, overall health)
- Easy installation
- Ease of carbon testing provides opportunity to participate in carbon credit programs

Competitor Analysis:

Key Players in Crop Analytics:

- CropX: an ag-analytics company that develops cloud based software solutions integrated with wireless sensors which boosts crop yield and saves water/energy. Has a team of employees based on 4 continents including experts in agriculture and technology.
- SoilOptix: a premium top soil analysis system that sets the standard for accuracy and precision in agriculture. The company provides services worldwide. Provides soil Analysis for growers so they can make informed decisions. (335 data points per acer). Over 25 layers are available including; physical properties, pH, organic matter and more. Have a data portal through which customers can access data. And the service is subscription based.
- PrecisionHawk: an information delivery company that combines unmanned aerial systems, remote sensing technologies and advanced data analytics to improve business operations and daily decision making.
- BioArva: services include; biological soil analysis, compost, ecological soil tech, regenerative soil consulting, and soil testing.

Through our analysis and research of other companies, we concluded that a large market exists in this industry.

Pricing Model:

Per unit revenue model for the sensor and *subscription* revenue model for software. Subscription price remains constant regardless of the number of sensors one entity purchases.

Model:	SoilSave Basic Sensor	SoilSave's Choice Sensor	SoilSave Premium Sensor
Price:	$500	$1,500	$2,000
Features:	NPK (Nitrogen, Phosphorus, Potassium) sensing capabilities	NPK, EC (electrical conductivity), and pH sensing capabilities	NPK, EC, pH, and customized nutrient sensing capabilities
Detection Range:	10m radius	20m radius	50m radius

Subscription:	Quarterly	Annual
Price:	$250	$1000
Features:	- Information accessible on website	- Sensor data accessible on website and mobile

	via portal - Advanced ML recommendations - Includes <u>3 months</u> sensor warranty	application via SoilSave portal - Advanced ML recommendations - Includes <u>2 year</u> sensor warranty - Data storage for up to 2 years

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Market Plan:

<u>Targeting based on the region:</u>
Our first action would be focusing on the Midwest Farm in the States and being a key player in that field. The reason for that is that the soil erosion problem in the Midwest is especially terrible. Sixty billion metric tons of topsoil in the Midwest have been lost over the past 160 years. Most fertile topsoil is entirely gone from a third of all the land devoted to growing crops across the upper Midwest. Furthermore, lots of farmers in the area are tilling their fields. Tilling has dropped the crop productivity 6% in productivity and even caused soil erosion and it leads to two billion dollar economic loss per every year. The average age of farmers in the Midwest is decreasing, with 35% of farmers now falling in the age group of 21-36 years old. This new generation of farmers has shown a larger affinity for adopting AgTech solutions to monitor crop and soil. We can target this customer segment by presenting our business at agricultural product showcases and through networking with coalitions that our target customers belong to.

<u>Two-way marketing strategy:</u>
We will approach our customers using both online and offline marketing. For the online marketing channel, we will have a website in which customers can view our sensors and our software packages, additionally interested customers can view updates and posts from our social media accounts. Classified listings in newspapers, agricultural magazines, and other media will serve as another method of market. For the offline marketing strategy, we will have sales agents reaching out over phone and presenting SoilSave's work at agricultural events and conferences.

Operations Management and Partnerships:

SoilSave will partner with companies, such as Farmtech, capable of manufacturing soil sensors to start production quickly. SoilSave will send design specifications to the companies, and the companies' factories will manufacture the sensors for a mutually agreed-upon price. Additionally, SoilSave looks to partner with cloud computing companies to facilitate the data

storage and transfer process. This will aid in the "real-time" data reading of our sensors. Cloud computing software in our sensors will upload data to our online software, where algorithms will analyze and display it to the consumer.

Financial Plan:

The process of creating the sensors would entail having to hire an engineering team to start the process of developing sensors. We would have to also hire a team of agriculture chemists who will be able to test the sensors alongside the engineers to be able give feedback on how to create the best user friendly sensors. There are additional teams such as our marketing team dealing with ads, social media,and email marketing. As well as our accounting/ financial team to keep the budgeting of this company from going bankrupt. These teams would roughly comprise 700K. After securing a partnership with a cloud computing company for the data analysis of the sensors this would round to 2,000 a year. Our company would also pay rent to a lab that will total to 100K yearly. In addition we would set aside an extra 5500 to help with any expenses that would hinder us from breaking-even. Then with a rougher estimate leaving us with 800K allowing for any buffer room for expansion of our teams, any legal action cost we may have to take or partake in. Or developing new product families that will help us in creating a more innovative sensor.

Contact SoilSave:
Our website: www.SoilSave.org
Product Questions: sales@SoilSave.org
Warranty and Software Help: Support@SoilSave.org

Sources
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