

MARKETING BIOCHAR

a Plan for Biochar Producers



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This plan was prepared for the Carbon War Room by a student team at Presidio Graduate School, and is intended to provide a basis for marketing plans for entrepreneurs and businesses in the growing biochar industry.

Table of Contents

<i>1. Executive Summary</i>	<i>4</i>
<i>2. Situation Analysis</i>	<i>5</i>
<i>2.1 Maturity of Industry, Market Size and Growth Trends</i>	<i>5</i>
<i>2.2 Vulnerability to Economic Factors</i>	<i>6</i>
<i>2.3 Seasonal Factors</i>	<i>6</i>
<i>2.4 Technological Factors</i>	<i>6</i>
<i>2.5 Regulatory Issues</i>	<i>7</i>
<i>2.6 Supply and Distribution</i>	<i>8</i>
<i>2.7 Financial Considerations</i>	<i>8</i>
<i>2.8 Competition</i>	<i>9</i>
<i>3. Brand Strategy</i>	<i>13</i>
<i>3.1 Brand Positioning</i>	<i>13</i>
<i>3.2 Brand Mission, Vision, Values</i>	<i>15</i>
<i>3.3 Brand Personality</i>	<i>16</i>
<i>3.4 Brand Story</i>	<i>17</i>
<i>3.5 Brand Essence</i>	<i>17</i>
<i>4. Marketing Strategy</i>	<i>18</i>
<i>4.1 Market Segments</i>	<i>18</i>
<i>4.2 Market Segment Profiles</i>	<i>18</i>
<i>4.4 Metrics</i>	<i>24</i>
<i>5. Bibliography</i>	<i>26</i>

I. Executive Summary

Biochar is a soil amendment that has been used for millennia by ancient civilizations to enrich soils by increasing its nutrient and water retention. A global effort to combat climate change (U.S EPA, 2010) has mobilized countries to find market solutions to help reduce the levels of CO₂ in the atmosphere. Interest in biochar has grown significantly since 2005 due to its unique ability to combine soil-enhancing qualities with its ability to sequester carbon.

This plan, commissioned by the Carbon War Room (CWR), defines a foundation for a marketing strategy for small and medium-sized biochar producers, an important segment of the industry. At present the market for biochar is too small to generate sufficient returns to incentivize investment in new biochar technology. This plan focuses on strategies for producers to stimulate the demand for biochar in order to increase the market size of the industry.

Of three identified niche markets for biochar, this plan expands the identified organic farming market to focus on gardeners, small-scale growers and other consumer applications. The consumer market will allow producers to sell their product at a higher retail price than would be currently possible when selling in bulk to farmers. Additionally, without a biochar certification process in place, consumer applications offer less risk than farming and agricultural applications.

The second part of the report provides biochar producers with market analysis of the small-scale grower market and describes how best to position themselves and differentiate their product from other fertilizers and soil amendments in this sector. The brand and positioning strategy section is aimed at helping producers create a strong brand message that appeals to their selected target audience. The report identifies two separate types of target market within the consumer application space, business-to-business (B2B) and direct-to-customer (D2C), and shows how the positioning and brand strategy differ depending on which audience is being targeted.

Finally, the plan walks the biochar producer through the various segments of the small-scale grower market, identifying how the product, price, place of distribution and promotions will differ depending on which segment the producers decides to target.

2. Situation Analysis

2.1 MATURITY OF INDUSTRY, MARKET SIZE AND GROWTH TRENDS

Biochar is a new and growing industry. Interest in biochar has grown significantly since 2005 when it was identified as a potentially viable carbon sequestration strategy (BCS 2011, p.13). Biochar has many attributes, but in its simplest form it can be described as a charcoal created when organic matter is burned using a low-oxygen process called pyrolysis. When mixed with soil, biochar is a powerful amendment that can improve water and nutrient retention and result in higher crop yields. The use of biochar dates back to more than 2,000 years ago when people in the Amazon produced biochar and applied it to the nutrient-poor soil to improve and cultivate the land (BCS, 2011 p.38).

At the time of this writing it is estimated that there are 130 biochar-related organizations and companies globally (L. Brunjes, personal communication, October 7, 2010). These organizations range from research-based entities exploring the use and scientific properties of biochar to expand its adoption, primarily by agriculturalists, to emerging technological and manufacturing organizations—the producers of biochar. Capital investment is greatly needed in the U.S. to make technological advancements and increase biochar production. Non-profit organizations such as the Carbon War Room and the International Biochar Initiative are actively working to facilitate industry growth. Collaboration efforts and strategic alliances with the scientific community and influential organizations such as World Bank and EDF are essential to increasing awareness about biochar, its properties and uses.

The biochar industry has grown 30 percent annually since 2005 (BCS, 2011 p. 1). A draft report (BCS, 2011) summarizes key trends in the biochar industry, and identifies three niche markets that are ready and appropriate to target for industry expansion. These niche markets include: biochar production within the municipal, green waste sector; biochar application within the organic farming sector; and biochar production utilizing livestock manure as a feedstock.

For the biochar industry to grow, more research, awareness and use of biochar are needed. Currently, the industry faces a situation where producers are relying on more demand for them to increase their output, while large-scale use of biochar requires more supply. One approach to triggering such growth is through enabling biochar producers and manufacturers to effectively market their products. Increasing appeal to end users by understanding customer needs can result in more “demand pull” in the industry. Therefore, this marketing plan has been prepared for biochar manufactures and producers, particularly those currently operating at a smaller scale, identified as one of the “ready” niche markets above. The strat-

egy of this paper is to provide a useful tool to support manufacturers in producing a high quality, bagged biochar product for the retail market, which, if properly followed, will increase biochar use and awareness. Home gardeners, nurseries, and small farms have all informed the design of this plan to ensure its relevancy to the targeted end-users.

2 . 2 V U L N E R A B I L I T Y T O E C O N O M I C F A C T O R S

There are few bagged biochar products available to gardeners today, so the price point that the market will bear is somewhat uncertain. It is important for biochar to be at price parity with its substitutes to reduce market vulnerability during economic downturns. These substitutes include other soil amendments such as fertilizer, compost, perlite (a form of obsidian characterized by spherulites formed by cracking of the volcanic glass during cooling, used as insulation or in plant growth media) and vermiculite (a yellow or brown mineral found as an alteration product of mica and other minerals, and used for insulation or as a moisture-retentive medium for growing plants).

Biochar is price sensitive to changes in the costs of feedstocks, such as wood or biomass scraps. Currently these materials can be obtained free or somewhat cheaply as a waste stream of other industrial practices. However, increasing demand could cause feedstock rate hikes and therefore increase the price of biochar. Transportation costs related to fuel fluctuations should also be considered.

Two additional external factors that could affect biochar pricing are water rate hikes and changes in carbon legislation. Biochar aids the water retention capabilities of soils. Therefore, water price increases would likely cause the avid gardener to seek out a solution such as biochar, especially in drought states such as California, as a cost saving measure. Additionally, as biochar sequesters carbon, changes in carbon market legislation could drive down pricing in the long-term.

2 . 3 S E A S O N A L F A C T O R S

As with any product within the agricultural sector, biochar will be influenced by seasons. Crop residue, one of the main feedstocks for biochar, is mainly harvested in the summer and fall months. Looking specifically at the nursery market, biochar would likely be needed most in the fall when gardeners are putting their plots to bed and in the spring when starts are being planted in new medium (L. Brunjes, personal communication, October 7, 2010).

2 . 4 T E C H N O L O G I C A L F A C T O R S

Many claims are made for biochar: it increases water retention, provides soil tilth, sequesters carbon, increases cationic exchange capacity and more. The Carbon War Room, sup-

ported by BCS Inc., is conducting a review of the 380 scientific articles contained in the International Biochar Initiative's online database in order to create a searchable database on the current state of scientific research and results of biochar. The review will categorize the studies into three broad levels of biochar research: Research Field, Biochar Production and Biochar Applications. This review will be complete in the first quarter of 2011 and will provide the biochar industry with a valuable tool, identifying exactly what is known and unknown about biochar, its production and application.

As this review is conducted, researchers will be identifying the top scientific studies on biochar. This analysis will give weight to studies that put emphasis on characterization of the char used in the study. The goal of identifying the top studies is to create a subgroup of the most comprehensive, rigorous science on biochar.

2.5 REGULATORY ISSUES

Biochar is currently an unregulated product that has yet to be thoroughly defined. This is partly due to the fact that the industry is in its developing stages and industry data is still being analyzed, and also due to the fact that different types of biochar are better suited to different soil types.

Regardless of this the industry has recognized the need to regulate which products can be produced and sold under the biochar name. The International Biochar Initiative (IBI) is currently working on a certification process for the industry. IBI will engage people and organizations from all stakeholder groups to understand the properties of biochar and how best to standardize the industry.

The certification process will include the following:

- A definition of biochar
- A set of parameters that define the product
- Source material and processing
- Properties and contaminants
- Classification framework

As was seen in the organic food industry, the implementation of a certification process will generate confidence among the purchasers and will assist the industry in moving from its current, early state to a more mature stage in its development. It is to be noted that IBI is not assessing the contribution that biochar makes to GHG emissions, even though biochar is currently marketed as a solution to climate change. Doing so will be the work of sustainability standards, which are separate from the general characterization standards that IBI is working on.

If biochar is to be sold into organic farming markets, consideration must be taken to comply with a region's organic standards.

2.6 SUPPLY AND DISTRIBUTION

Various sources of biomass have been identified as inputs for biochar production, making supply a matter of identifying a feedstock that offers an economical, productive input. Different feedstocks will contribute different nutrients to biochar, offering varying impacts on soils over time. As previously noted, more research is needed to precisely define the benefits associated with different feedstocks. However, for current applications, the feedstocks output by the niche markets previously mentioned offer a good potential supply, but producers should stay up to date on research in order to effectively present the benefits of biochar when marketing.

Marketing to gardeners leaves some freedom to experiment with distribution models. Until supply and production can be reliably scaled to handle high volumes, small, local markets are likely to precede the growth of large, national ones. Sales outlets include home and gardening stores, garden catalog companies, and direct-to-consumer sales. Many distribution companies carry products that complement or compete with biochar, including fertilizers, soil adjuncts, and potting soil. Gaining distribution for biochar through one of these existing channels will grow the potential reach of a small producer. Producers who can tap into a familiar market or who have the marketing means necessary could distribute biochar directly to the end customer, which may offer higher margins than selling through a distributor.

2.7 FINANCIAL CONSIDERATIONS

Biochar manufacturing costs vary widely depending upon the technology used. A small scale operation using low tech equipment (such as an in-ground pyrolysis chamber) could cost very little, whereas large industrial equipment could cost millions of dollars. End product pricing is also highly dependent upon biochar yields from the pyrolysis process. (L. Brunjes, personal communication, October 7, 2010)

Manufacturers will need to consider if they want to sell their biochar as a standalone product or as a blended product with various composts and fertilizers. If manufacturers work with existing market players such as Scott's, then the costs to bring their product to market would arguably be reduced. For example, a biochar manufacturer could choose to sell their product directly to one of these existing companies who would then bear the costs of marketing and bringing the product to market. Should the biochar manufacturer decide to sell direct to consumers or direct to retail partners, then they will need to bear the costs of bagging and marketing the end product.

BAGGING

“One way to enter the bagged product market is to work with a contract bagging company. The other is to take the plunge and purchase equipment to have on-site. The following “tried and true” tips and lessons-learned are helpful when evaluating equipment options:

High Volume Vs. Low Volume: What is the scale of a program's bagging endeavor? Is it seasonal production? Year round? Multiple products? “If this is about being a major packager - selling in high volume to a major mass merchandiser, for example - then a fully automated line that starts at about \$120,000 is needed,” says Fred Schumpert of Creative Packaging, Inc. “If they just want to get into the business to expand their market reach or service some niche markets locally, they probably only need an investment of roughly \$35,000 to \$60,000.”

—Nora Goldstein, “Expanding Markets with Bagged Products”

BioCycle, March 2006, Vol. 47, No. 3, p. 58

2.8 COMPETITION

2.8.1 COMPETITION

Biochar is a type of soil amendment. Biochar needs to be mixed with soil, and is often combined with fertilizer to maximize its effectiveness. Results from using biochar will vary according to the soil properties and the type of organic feedstock used to create it. From a competitive position, biochar competes with other soil amendments. Soil amendments can be classified as organic and inorganic. The following chart defines competitors, identifies major players and describes their competitive positioning.

Figure 1: Soil Amendments

TYPE	CLASSIFICATION	DESCRIPTION	MAJOR PLAYERS	COMPETITIVE CONSIDERATIONS
Inorganic	Synthetic Fertilizer	Chemically manufactured to add Nitrogen, Phosphorous, Potash (NPK) and other nutrients to the soil.	Scotts Miracle Gro	Usually the least expensive option and widely available. Varieties address specific soil deficiencies. Easy to use and generally accepted as a best practice.
	Other	Minerals, sand, perlite, vermiculite, gravel, tires	PVP Perl-Lome	Increases water retention and increases porosity
Organic	Previously living	Manure, guano, urea, wood (sawdust), grass clippings and peat.	EB Stone Bat Guano, EB Stone Soil Booster, ECO-MIN	Minimal processing. Fast decomposition. Attracts microorganisms. Reduces or provides a substitute for applying pesticides and synthetic fertilizers (NPK).

TYPE	CLASSIFICATION	DESCRIPTION	MAJOR PLAYERS	COMPETITIVE CONSIDERATIONS
		Biochar	CharGrow	Long lasting, improves water retention, nutrient absorption, remediates soil, has been proven to outperform other amendments when used with fertilizers (NPK).
	Living	Includes worms, micro-organisms and fungus. They break down organic matter and provide important micro-nutrients. Cover crops fix nitrogen and enrich soil.	EM1	Fungus increases nutrient absorption. Worms aerate the soil and increase porosity. Worm excretions (castings) provide additional fertilizing properties (nitrogen, phosphorous, potash, magnesium).
	Combination	Organic fertilizers	Grow Power, ECO-MIN, Drammatic “ONE”	Easy to apply. Provides fertilizing nutrients (NPK) and important micro-organisms. Prevents nutrient run-off. Protects biodiversity.
		Compost	Black Gold Compost	Safe. Utilizes organic waste, provides NPK.

2.8.2 KEY TAKEAWAYS

Customer preference for a type of soil amendment will depend on current soil deficiencies and the desired correction (porosity, water retention, nutrients, etc.). Also, an important determinant will be customers “ease of use” and preference for using a liquid, powder or a soil mix.

Among all soil amendment types, that which competes most directly with biochar is compost, since they both use organic feedstocks. The compost industry also provides valuable insight into the launch of a soil amendment industry, as seen later in the brand strategy section of this report.

2.8.3 CRITICAL ISSUES AND KEYS TO SUCCESS

What makes biochar different from compost are its adsorption properties, high porosity, its ability to sequester carbon and its durability. Biochar is also very versatile and is often applied with other fertilizers to be even more effective.

In order for the biochar industry to grow, several critical issues need to be considered.

DEFINITIONS & LOW BARRIERS:

There are low barriers to entry for biochar. In fact, biochar organizations are working to establish clear definitions, asking “What is biochar?” and “What are acceptable compounds that can be used to make this product?” Clear delineation and established regulations will need to be produced and enforced to make sure biochar quality and properties, like soil remediation and carbon sequestration, are not compromised.

SCALE:

The biochar industry needs to scale up to become a more active competitor as a soil amendment. Currently biochar only makes up a tiny fraction of the soil amendment market.

EDUCATION & RESEARCH:

Much remains to be learned about biochar. In the consumer market, on which this plan will focus, there is little awareness of what makes up biochar and how it should be used. More research must be undertaken to better quantify, qualify and prove its soil-enhancing properties.

2.8.4 S W O T

Below is a SWOT (strengths, weaknesses, opportunities and threats) analysis of biochar, focused on the marketing potential and barriers that exist in this exciting growing industry.

Figure 2: SWOT Analysis

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> • All Encompassing – Biochar increases porosity, micro-organisms, soil nutrition, water retention, crop yield, and sequesters carbon • Versatility – Can be applied with any fertilizer, can be made to fit different soils • Feel Good Factor – No other substitute sequesters carbon. Gardeners care about the environment • Long Lasting – Biochar need only be applied once to give soil lasting health 	<ul style="list-style-type: none"> • Soil Enhancer – Must be mixed with soil and fertilizer. Extra cost • New Industry – Biochar is untested and unknown. Needs more scientific proof • Rudimentary – Looks ineffective compared to complex fertilizers • Price – More expensive than competitors • Limited Supply – There are currently few biochar producers
OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> • Climate Change – Sequestering carbon could become a valuable product quality with changes in carbon legislation (carbon markets) • Water Shortage – Water scarcity and associated rate hikes may make water retention a valuable product quality • Organic – The organic food market is growing rapidly as people become more aware of the dangers of synthetic fertilizers • Organic Waste Streams – More readily available organic waste for feedstock due to new city waste programs 	<ul style="list-style-type: none"> • Corporate Exploitation - If the market grows large corporations could try to control the market. Potential unethical endangerment of feedstock resources such as virgin forests • Negative Scientific Results - Some scientists do not believe in the environmental qualities of biochar • Anti-Biochar Groups - Organizations such as BiofuelWatch and EcoNexus are campaigning against biochar • Large Agri-Business Opposition – Companies like Monsanto could use lobbying power to destroy biochar reputation • No Regulation/Certification – Poor quality biochar could enter the market and ruin reputation due to unregulated methods and feedstocks

3. Brand Strategy

The first question a biochar manufacturer should ask when formulating a brand strategy is: “Who is the target audience?” This vital question will determine brand positioning and the brand messaging that is ultimately relayed to the customer. For the purposes of this report, “B2B” (business to business) and “D2C” (direct to customer) have been chosen as two key audiences on which biochar manufacturers should focus. This section illustrates how the message will differ depending on each segment’s demands.

KEY FACTORS FOR SUSTAINABLE BIOCHAR

Producers should:

- Utilize the heat in biochar production
- Obtain biomass feedstocks that are not:
 - crop or animal feed sources
 - grown on land recently converted from native forests
- Minimize transportation of biomass feedstock and char products
- Conduct a full lifecycle assessment of both product and process
- Uphold transparency and stakeholder engagement as core business practices
- Scale at a rate in which you can maintain quality of feedstock and final products

3.1 BRAND POSITIONING

An example of how a biochar manufacturer might position itself follows: “To gardeners of every scale that care about productive and healthy soils, biochar is a long-lasting soil enhancer that improves nutrient and water retention without the use of harmful chemicals.” Additionally, there must be some consistent messaging throughout the industry in order to protect biochar’s reputation and position as a “S.A.F.E.” (see Figure 2) soil enhancer.

Figure 2: Universal Brand Characteristics—S.A.F.E.

	KEY CHARACTERISTICS	DESCRIPTION
S	Sustainability	Biochar helps restore and maintain soils while also sequestering carbon to help combat climate change.
A	All-Encompassing	Biochar is a versatile product with a multitude of beneficial attributes for soil health
F	Feedstock	Feedstocks should be organic matter that does not negatively affect the environment from which it was taken.
E	Easy to Understand	The message of biochar should be kept simple so that a target audience can understand what it is and how to use it.

3.1.1 TARGETING B2B

The main advantage of selling direct to businesses is the ability to sell in bulk quantities. Biochar can be sold into channels such as soil blenders, large fertilizer companies, turf grass distributors, etc. In this case, biochar may simply become a line extension of other large powerhouse brands in the industry. For example: Scott's Organic Potting Mix Now With Biochar! (see Figure 3 below).

Figure 3: Scott's Miracle Gro Potting Mix With Biochar—Packaging Mockup



In this case, biochar producers carry less responsibility for customer facing branding of the product. Line extension positioning advantages include:

- Greater acceptance because customers will infer positive attributes about biochar because of its association with the well-known large brand. This increases the probability of adoption.

- This also takes the burden of establishing the positive attributes of the product off the biochar producer, thereby reducing their financial risk of building a brand.

Before settling on this route however, biochar producers should ask themselves the following questions when evaluating partnerships:

1. Do the partner's brand values match the values of the producer? In reference to the brand positioning of biochar as a S.A.F.E. product (see Figure 2 above) it is important that sustainability is part of the target company's value proposition. Biochar should not become a way for companies to "greenwash" their dirty products.
2. Is the company's brand well-recognized? The more well-known the brand is the more exposure and the higher the potential sales.
3. Does that brand have potential for growth? A partner's growth goals should align with the producer's. Production ability should be considered in terms of anticipated demand.
4. Does the company want to differentiate itself from its competitors by adding biochar to its product?

3.1.2 TARGETING D2C

Selling direct to customers also has some valuable advantages that should be considered before ultimately deciding upon a direction. Two of these advantages are listed below:

- More power over branding—likely to maintain authenticity of the biochar product
- Could command a higher profit margin - by using retail over wholesale pricing

3.2 BRAND MISSION, VISION, VALUES

When defining the Mission, Vision and Values it is important to articulate "why" a company produces biochar before delving into the specifics of "what" or "how" the product is made. If customers understand the core purpose of why the producer entered the biochar market, then the brand is more likely to resonate and attract a loyal customer base. People do not buy what a company does, they buy why that company does it (Sinek, 2009).

3.2.1 MISSION

The mission statement of a company should reflect the company's vision and define what the company wishes to accomplish. It essentially drives the vision. This should be aligned with the goals and value proposition of the company. When defining the mission statement the company should consider the following questions:

- Why are we in business?
- Who is our customer?
- How do the values of the company and the end user align?
- How will we ensure fidelity to our mission?

Producers should implement feedback loops, to continually drive the vision through the company's mission.

EXAMPLE 1: MISSION STATEMENT EXAMPLE

“Our mission is to produce an effective, safe and long lasting soil enhancer that maximizes soil fertility while restoring a healthy environment.”

3.2.2 VISION

The vision is a short statement describing where a company wishes to see itself in the future. The statement should think big and harness “why” the company produces biochar in the first place. Getting at the “why” is central to establishing an emotional connection with the end user as stated above.

EXAMPLE 2: VISION STATEMENT EXAMPLE

“We strive to be an active leader in creating a healthy and more beautiful natural environment by maximizing soil productivity while simultaneously combating climate change.”

3.2.3 VALUES

Brand values embody what the organization stands for—its core beliefs and purpose. Brand values should seek to establish loyalty within the chosen customer segment. Some examples of brand values to which a biochar brand could be dedicated include:

- Sustainability
- Organic, natural ways to nurture the environment
- Providing a product that maximizes soil potential
- Reducing carbon emissions
- Promoting a waste free-world—closed loop (waste=food)
- Healthy soils
- Biodiversity in the soil

3.3 BRAND PERSONALITY

If a biochar brand were a human being, what would be the characteristics of its personality? When establishing a brand, a producer should consider how these personality traits resonate with its target audience. Depending upon the end user, a producer may want that user to describe the brand as simple, sustainable, scientific, or even sexy. What is inspiring about the brand? This is how the customer will ultimately perceive the company.

3.4 BRAND STORY

Brand personalization can be achieved through storytelling. Biochar has been used for several thousand years as a soil amendment in the Amazon. Linking this history with specifics of how a company became passionate about the industry could be an effective method for communicating brand values. One way to communicate a brand story is by using quotes from gardeners or farmers highlighting the positive aspects of biochar on packaging, the company's website, social media, and printed materials.

3.5 BRAND ESSENCE

The biochar industry's fundamental essence should be about sustainability and systemic thinking. However, there are other core ingredients that could make up an individual company's brand essence in addition to sustainability. It should be noted that any given biochar brand cannot be "everything" to "everyone." Highlight the brand attributes that align the company's brand and its target audience. For example, not all audiences will be interested in carbon sequestration. Below are examples of attributes that could describe a brand:

- Sustainability (remains at the core of biochar)
- Long-lasting & resilient
- Improves water retention
- Encourages micro-organism growth
- Sequesters carbon
- Increased yield
- Versatile
- Increases soil porosity

EXAMPLE 3: BRAND ESSENCE EXAMPLE

"Bob's Biochar: Sustainable and long-lasting soil enhancer"

4. Marketing Strategy

4.1 MARKET SEGMENTS

The six segments of the small-scale grower target market are merely a starting block of the various potential market niches available to biochar in the US. As we mentioned in the situational analysis (Section 2.1), this smaller market of small-scale growers has been identified as a solution to the current chicken/egg situation of lack of supply for lack of demand. These markets are smaller and easier to enter and will prime the pump for eventual marketing to farmers. Focusing first on the segments described below will increase awareness and knowledge around biochar and its many attributes.

This marketing strategy is intended to encourage biochar manufacturers and producers to focus on producing a high quality, biochar product for the retail market that is targeted toward six customer segments: nurseries; soil and fertilizer companies; turf grass companies; green roof contractors; home gardeners; and school and community gardens. The market attractiveness of each segment is included below.

4.2 MARKET SEGMENT PROFILES

The market attractiveness of each of the six segments is outlined below, including a brief explanation of the attractiveness of biochar within each segment, providing an excellent starting point for brand positioning and messaging.

4.2.1 NURSERIES

According to the US Census Bureau (2002) there are more than 11,000 Nursery and Garden Centers in the U.S. which sell soil amendments and fertilizers. Annual sales within this market are estimated at \$20 Billion,



with 20% of total sales from soil products (U.S. Census Bureau, 2004, p. 3). According to the National Gardeners Association, organic lawn and gardening care grew 58% from 2004 to 2008 to comprise 12 Million



J and J House Brand Soil

households. This market is expected to keep growing (NGA Market Research, 2008). The potential for biochar in this segment lies not only in the obvious sale of biochar as a growing medium

for the nursery's product. Oftentimes nurseries offer house-brand soil products, for exam-

ple, J&J's Garden Center potting soil seen here, these house-brands are an opportunity to reach the gardener market segment through a trusted name and brand identity.

MARKETING TIP #1

Becoming a member of regional and national nursery associations will provide access to trade shows, conferences and decision makers in this segment.

“Nursery associations provide a range of support to nurseries including educational sessions, publications, and trade shows. Trade shows are a great place to show your wares, contact suppliers, or to simply learn about the nursery industry in your state.” (“National and Regional Nursery Associations,” n.d.).

4.2.2 SOIL AND FERTILIZER COMPANIES



The soil mixing industry is valued at \$3 Billion, and is comprised of companies that mix pre-manufactured components into soil and fertilizer products (Industry Statistics Sampler: NAICS 325314 Fertilizer). Scotts Miracle Grow dominates the US soil and fertilizer market with more than 50% market share (SMG: Scotts Miracle-Gro Company). Companies which specialize in organic soil amendments, such as EB Stone, will profit from the growth in the organic gardening market.

MARKETING TIP #2

Biochar product attributes, such as durability and promotion of microbes and fungus, make it an attractive complement to established brands, giving them a market advantage. For more information on the potential for biochar penetration in this segment, see B2B positioning in Section 3.1.1

4.2.3 TURF GRASS

The turf grass or sod industry is a fast growing segment of the green industry with \$1.3 billion of annual sales in 2007 up from \$1 billion in 2002 (USDA Ag Census Reports. Turf grass Producers International). Turf grass is an attractive soil erosion and landscaping medium, with the ability to be installed year round. Turf grass is often used in golf courses and with other sandy soils, providing a great opportunity



for biochar. A report from Iowa State University shows that biochar has great potential in the essential water retention capabilities in turf grass (Brockhoff, 2010). Peat moss has been traditionally used in the industry to aid in water retention, though this same study found that when the peat moss breaks down after several years, it hinders water retention. Biochar provides a stable water retaining property to the turf grass leading to healthy grass and better erosion control.

MARKETING TIP #3

Leverage the scientific benefits and research findings when positioning the biochar product within this segment. Focusing the marketing message around biochar's retention properties will garner goodwill and credibility.

4.2.4 GREEN ROOFS

With 16.1 percent growth in 2009, the green roof industry is growing rapidly across the US (Nigel, 2010). Green roofs are mainly found in urban settings, in order to combat the heat island effect of cities. The most popular city for green roofs is Chicago, where the city offers incentives for builders to install them. A recent study by Portland State University showed that green roofs that utilize biochar as part of their growing medium “showed significant increases in retention of nitrogen, phosphorus and organic carbon” (Beck, 2010). This retention is particularly relevant to green roofs as they must be built to withstand storm water runoff. Biochar prevents nutrient leaching.



MARKETING TIP #4

The lightweight characteristic of biochar proposes a market advantage in this segment. As engineering specifications often hinder green roofs from being built due to their excessive weight, biochar has a competitive advantage over other soil products.

4.2.5 HOME GARDENERS



According to a 1997 Survey from the National Gardening Association (NGA), it was estimated that 40 million households in the U.S. have a garden (NGA Market Research, 1997). A more recent survey from 2008 indicated that home gardening was expected to increase 20% by 2009 due to a growing interest in cultivating fresh herbs, fruits and vegetables and wanting to save on retail food costs (NGA Market Research, 2008). In 2007, NGA estimated that the average annual cost consumers spend on gardening and lawn care is around \$430 for households that include two people and an annual income of \$75,000 or more (NGA Market Research, 2007).

MARKETING TIP #5

A potentially viable channel for marketing a biochar product to this segment is through Organic Gardening Magazine, which has 210,500 active subscribers, 66% of which are female with an average age of 43 (“Mailing List: Organic Gardening Magazine by American List Counsel,” n.d.). A well-designed direct campaign to this segment could produce a response rate between 1.5 – 3% response rate (“Typical Direct Mail Response Rates - Small Business Marketing Tips - Entrepreneurial Tips – Resources for Entrepreneurs - Gaebler Ventures - Chicago, Illinois,” n.d.).

4.2.6 SCHOOL AND COMMUNITY GARDENS

Use of school and community gardens are on the rise. An estimated 5 million US households desire a garden in their community, up from 3 million in 2008. Nearly 20% of US households knew of gardening activities at their child’s school while 55% desire school gardens (Community Gardening and Greening Studies). This trend is driven by the desire for more green space, local food, and fresh organic food. Biochar could play a significant role in this segment as these gardens are predominately educational and participants are curious about new soil mediums. The carbon capture characteristic could be highlighted to this population as it is concerned with its local and global environments. In local



biochar systems where the feedstock is known to be a nuisance to the community, i.e. the beetle-killed pines of Colorado, presents a localized solution and a more attractive product, highlighting the whole systems nature of a biochar system.

MARKETING TIP #6

Sending biochar samples to Community Gardens for their use on plots, and sponsoring events and gardening workshops at their sites is one way to build relationships with this segment. This approach will also expose gardeners to a direct experience with the biochar product and allow attendees to learn about the benefits of biochar and see the results of application.

4.3 MARKETING MIX

Marketing to these six target segments involves two approaches: marketing to a business (B2B), and marketing directly to consumers (D2C). Depending on the audience, the size of the buyer and the segment’s growth potential, the brand and positioning points used will vary as previously mentioned in the brand strategy section. Although specific product features will be highlighted over others in the marketing mix, all product messaging should embody S.A.F.E. principles (see Figure 1 on page 10). The following marketing mix strategies illustrate the key differences in the product, price, promotion, and place for direct to consumer marketing versus business to business marketing.

4.3.1 BUSINESS TO BUSINESS MARKETING (B2B)

Target segments include nurseries, soil and fertilizer companies, green roof contractors and turf grass companies.

PRODUCT	PRICE
<ul style="list-style-type: none"> • An additive that is applied to business’s soil-related product • Enhances the business’s retail product • Complements the business’s brand • Provides a unique differential feature to the retail product • Scientific properties are leveraged to garner credibility and trust 	<ul style="list-style-type: none"> • Contract-based • Wholesale volumes and pricing • Subject to regulations, supply and demand, and type of feedstock used • Current wholesale rate is \$1/pound (BCS, 2011 p. 20)
PROMOTION	PLACE

<ul style="list-style-type: none"> • Direct sales to businesses • Sales personnel maintain customer relationships • Biochar additive is promoted in customer's product advertising as a differential product feature • Below the line marketing tactics (e.g. trade shows and one-off events) 	<ul style="list-style-type: none"> • Business customer becomes the channel to the retail market • Target segments are located throughout the U.S. • Start outreach to those companies that are closest to reflect sustainability essence
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4.3.2 DIRECT TO CONSUMER MARKETING (D2C)

Target segments include home gardeners and school and community gardens.

PRODUCT	PRICE
<ul style="list-style-type: none"> • Bagged biochar (either as part of a blend or alone as an unconditioned product) • Leverage brand essence when portraying product features • Include nutrition label on packaging to clearly communicate product characteristics and benefits 	<ul style="list-style-type: none"> • Range from \$12-\$34 for 10-14 quart bags • Pricing should be evaluated in comparison to other soil enhancers • Premium could be applied to carbon conscious audiences
PROMOTION	PLACE
<ul style="list-style-type: none"> • Social media networks • Partnerships with community gardening programs • Advertise through gardening and relevant publications 	<ul style="list-style-type: none"> • Direct marketing to end users • Online Sales • H&G Network (TV) • Demo-plots at nurseries • Product distribution through nurseries and major chains like Home Depot

PEOPLE & PLANET

For both B2B and D2C audiences, biochar entrepreneurs and manufacturers should consider a local approach to customer outreach. Rather than casting a wide net, starting local will allow for more direct feedback loops, as customers learn about and use the biochar product. This can be especially valuable given the newness of the product. Focusing on local customers, a regional supply chain, and locally available feedstocks reinforces the sustainability attributes of the product.

4.4 METRICS

Profitability is certainly a key measure that should be considered, regardless of audience. For example, producers targeting the B2B market not require as high a marketing budget as if they targeted consumers, an expense that impacts the producer's overall profitability. As a result, the producer may choose to focus on the B2B audience and collect a smaller margin but make larger overall profits on wholesale volume sales.

The Customer Lifetime Value (CLTV) is also an important metric. CLTV is "the net present value of the stream of future profits expected over the customer's lifetime purchases. The company must subtract from its expected revenues the expected costs of attracting, selling, and servicing the account of that customer, applying the appropriate discount rate" (Kotler & Keller, 2008, p.132). Calculating CLTV will be particularly useful for assessing the profitability of the B2B market, and comparing which segment generates the most value with repeat purchases. Templates from [Agile Insights](#) provide user friendly tools, such as the CLTV spreadsheet below, that can be used to calculate useful marketing metrics.

Figure 4: Customer Lifetime Value Spreadsheet.

	A	B	C	D	E	F	G	H	I
1	6.1	Customer Lifetime Value (CLTV)							
2		Discount rate r		12%					
3		Acquisition cost (AC)		\$100					
4		Churn rate		15%					
5		Retention rate $p = (1 - \text{Churn})$		85%					
6									
7			Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	
8		Margin		\$ 60	\$ 55	\$ 75	\$ 95	\$ 100	
9		Marketing cost	\$ (100)	\$ (10)	\$ (10)	\$ (15)	\$ (15)	\$ (15)	
10		Other costs to serve		\$ (5)	\$ (7)	\$ (6)	\$ (7)	\$ (8)	
11		Customer profit	\$ (100)	\$ 45	\$ 38	\$ 54	\$ 73	\$ 77	
12									
13		Profit $\times p^n / (1 + r)^n$	\$ (100)	\$ 34	\$ 22	\$ 24	\$ 24	\$ 19	
14									
15		CLTV	\$23						
16		Change these cells for your business							
17									
19									
20									
21									

When marketing to the D2C audience, tracking customer acquisition costs and take-rates per each channel and promotion method used in a campaign will help determine the most effective outreach strategies and inform future marketing efforts to that segment. Below is an example marketing template from [Agile Insights](#) that could be customized to track acquisition costs of marketing tactics used in a campaign to reflect response rates to hosting events, sending out a direct mail, online advertisements, etc.

Figure 5: Marketing Essentials Spreadsheet.

	A	B	C	D	E	F	G	H	I	J	K	L
1	5.3	Calculation for the 4 Essential Metrics										
2	(a)		Year 0	Year 1	Year 2	Year 3						
3		Marketing & All Other Cost	\$ (100)	\$ (250)	\$ (250)	\$ (250)						
4		Revenues	\$ -	\$ 300	\$ 300	\$ 300						
5		Profit (Revenues - Cost)	\$ (100)	\$ 50	\$ 50	\$ 50						
7		r	15%									
8		NPV	\$12.31									
9		IRR	23%									
11		Incremental Cash Flows	\$ (100)	\$ (50)	\$ -	\$ 50						
12				Payback ==>								
13				Middle of year 2								
16												
17	(b)		Month									
18			1	2	3	4	5	6	7	8	9	
19		Marketing & All Other Cost	(60)	(20)	(20)	(10)	(20)	(20)	(10)	(20)	(20)	
20		Revenues	-	25	25	15	30	30	20	30	30	
21		Profit (Revenues - Cost)	(60)	5	5	5	10	10	10	10	10	
23		Annual r	15.0%									
24		Monthly r	1.25%									
25		NPV	\$1.04	(000's)								
26		Monthly IRR	1.6%									
27		Annual IRR	19.21%									
29		Incremental cash flows	(60)	(55)	(50)	(45)	(35)	(25)	(15)	(5)	5	
30									Payback ==>			
31									End of Month 8			
34												
35												
36												
37												

Agile Insights. (n.d.). Retrieved from <http://www.agileinsights.com/>

Biochar producers should consider the effectiveness of their websites and build them as a tool for lead generation and sales conversion. A social media strategy should be developed to generate traffic to the website and specific audience-appropriate landing pages. Click-through rates, bounce rates, and number of visits are a few easy metrics provided by google analytics that can be tracked to inform website improvements.

Finally, another tool that should be incorporated into metrics is a way to receive customer feedback. Because biochar is an unfamiliar product to most end-users it will be important for producers to provide ways for customers to ask questions, gather information on how the product is being used and the results of application. Receiving and tracking customer feedback will allow for adjustments to be made as different marketing approaches are tested within each target segment.

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