

Promoting EM Expansion Activities Through Marketing EM Products: Results of a Marketing Study of EM for Agricultural Applications in the United States

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Abstract

In 1996-97, EM Technologies, Inc. of Tucson, Arizona, USA contracted for a professional marketing study of EM for Agricultural Applications in the United States. The study was performed in two phases.

Phase I: Product Policy and Competitor Analysis, evaluated EM products for agricultural applications and determined in broad terms which products and markets were open to near-term market entry and expansion. Phase I also examined the competition in the target markets and identified very significant opportunities for EM expansion through marketing EM products in five of the eight categories evaluated, namely, odor control, compost inoculant, training and consulting services, home garden products and soil inoculant.

Phase I also identified the specific research that might be required to open a potential market for EM technology, such as a replacement for methyl bromide applications in high value vegetable crops or as a treatment for Karnal bunt disease in wheat. Phase I examined the impediments to effective marketing, such as the need to accelerate translation of EM related documents into US English.

Phase II: Market Study and Analysis of EM Microbial Inoculum Products, examined in detail the opportunities and challenges involved in the entry of EM into the US market. Specific, focused analysis was done for five products and applications. These were, odor control in hog confinement operations, kitchen waste composting, EM seminars and workshops, compost inoculants for commercial-scale composting projects and crop-specific applications of EM microbial inoculants.

Market potential was determined by conducting phone surveys with competitors and cooperators and potential users. Specific recommendations included analysis of market potential, budgets and anticipated revenue streams for entry into these five markets. The results of this marketing study show that there is very significant potential to foster EM expansion activities through marketing of EM products. While this study was conducted to evaluate marketing of EM products under US conditions, the results should be adaptable to EM expansion activities in many other countries as well.

Introduction

EM expansion activities in the United States represent an opportunity to market EM products, goods and services in the world's leading economy. Market analysis suggests that tens of millions of dollars of potential markets are available in the near term, and hundreds of millions of dollars of potential markets, or more, are available in the long term. EM products have been shown to have applications to many sectors: in agriculture, manufacturing, the building industry, food processing, waste handling, recycling, water treatment, automotive, health and medical fields, to name only some of the applications already developed in Japan. To introduce EM to America successfully, we must achieve a thorough understanding and analysis of the existing competition, products and markets, and position EM according to its unique advantages. Paradoxically, EM philosophy seeks to avoid direct business competition, and focuses on cooperation and co-prosperity. This aspect of EM expansion activities works to its advantage, as the door is open to make cooperative agreements with existing companies and distributors who otherwise might be considered competitors. This reflects the unique nature and adaptability of EM itself, which exploits the niche of anaerobic conditions using the fermentation process and the production of zymogens and antioxidants. In this way, EM not only makes a home for itself in an otherwise polluted and putrefactive environment, it also produces substances and conditions that enhance the life of other beneficial organisms, including, ultimately, human beings. Astutely observing this role of EM in the environment, Dr.

Teruo Higa, the discoverer of EM technology, has developed EM philosophy and business strategy to follow the model of EM itself.

Developing an EM Marketing Plan for Agricultural Applications in the USA

Since the origin of EM technology is based in agriculture, especially Kyusei Nature Farming, it was decided to first develop an EM Marketing Plan for the agriculture sector in the United States. A consultant company with many years of experience in developing professional marketing plans in the agriculture sector was hired to do a study of the potential market for EM products and to develop a plan for introducing EM to the US market. The study was conducted in two phases. Phase I was a scoping phase, where the consultant met with the management of EM Technologies, Inc. and was educated about EM products and applications for agriculture. The consultant examined these products and applications and analyzed the potential for near term marketing opportunities. In Phase I, the competition for EM products was analyzed, and the obstacles to market penetration was examined. Phase II studied the marketing opportunity for five specific markets identified as having significant potential during Phase I. In Phase II, a detailed Marketing Plan for these five markets was presented. The methodology used included phone surveys and face-to-face meetings with many sources of expertise. On-line database searching was performed to analyze competitors and markets, and an existing, extensive specialized database for agriculture was also used. The experience and expertise of the consultant company, working in close consultation with the management of EM Technologies, Inc., were highly instrumental in performing the market analysis and developing a highly relevant marketing plan at minimal cost.

Phase I: Product Policy and Competitor Analysis

The first phase of the marketing plan for EM Technologies, Inc. involved the development of the company's product policy and the identification of potential competitors and cooperators within the recommended product categories. The evaluation and development of the product policy for EM involved a threefold process including:

- Analyzing the key trends that will impact agriculture in the United States during the next ten to twenty years
- Developing a corporate profile of EM Technologies, Inc. and its products that focus on the company's strengths and weaknesses and identify internal opportunities for product development;
- Selecting product categories and specific products that should be the basis of the company's marketing plan founded on the key trends occurring in agriculture, the company's profile and the size, growth and other attributes of the potential markets for EM.

The first phase also identified companies, university researchers and other organizations that could function as potential cooperators in the development of EM Technologies, Inc. programmes in research and marketing.

Phase I: Results Mega Development in Alternative Agriculture

The rapid and sustained growth of the organic food markets during the last five to ten years, combined with heightened concerns about the environmental impact of conventional agriculture, are creating the potential for substantial growth in agricultural inputs that support alternative reduction systems. The key Mega trends of this shift to alternative agriculture are;

- Expansion in the US market for organic foods from \$178 million in 1980 to \$2.8 billion in 1995, with recent annual growth rates of 20 to 25 percent.
- Growth in the US market for natural products to \$9.1 billion in 1995.
- Increase in US organic crop acreage from 500,000 in the mid-1980's to an estimated 2.75 million in 1995.
- Possibilities of organic food markets and acreage expanding from 1 percent to 10 percent of total markets and acreage.

- An accelerating trend among conventional chemical-based farmers to shift to sustainable farming techniques, including integrated pest management and the use of biorational crop protection and fertilizer products.

These trends combine to create the potential for the emergence during the next ten years of a multi-billion dollar market for biorational plant protection and fertilizer products, like EM technology. Because of these Mega trends, EM technology could play an important role in 21st Century agriculture and develop a market in the billion-dollar shift that is occurring in new crop protection and fertility products.

Profile of EM Technologies, Inc.

EM Technologies, Inc. was established as a not-for-profit corporation on June 15, 1993 in Tucson, Arizona, USA to promote the research and expansion of EM technology in the US, Canada, Mexico and Central America. While the focus of EM activity is non-profit educational and scientific research work, corporate strategy also includes developing and marketing EM products and services to earn indirect income that is used to help support the non-profit objectives. Prime assets that can be used to advantage to market EM products include:

- Unique products that help make alternative agriculture cost-effective and economically viable compared to conventional, chemical-based farming inputs;
- Substantial research on many kinds of EM applications in agriculture such as reported in the proceedings of the International Conferences on Kyusei Nature Farming, the annual APNAN Conferences and by EMRO;
- Active, hands-on training programmes by EM Technologies, Inc. staff combined with Dr. Higa's books and lectures that has helped create a network of EM sales agents and volunteers in many states;
- Registration of EM products for sale as bona fide fertility inputs by various states, and approval of EM for use in organic agriculture by various private organic certification organizations such as CCOF and Oregon Tilth;
- Recruitment and training of talented management and staff.

Major weaknesses include only limited written materials available in English suited for supporting a marketing effort in the US, and the limited amount of research and demonstration projects conducted in the United States.

Selection of Recommended Product Areas

A product opportunity matrix was developed to identify product areas that best match EM Technologies' strengths that offer excellent growth opportunities. The key selection criteria used in the matrix included:

- a) Available technical research and the requirements for further research.
- b) The potential size and growth of the market.
- c) Ease of entry to the market.
- d) The potential to generate immediate cash flow.
- e) The advantages of specific EM Technologies assets relevant to each product and market.

Using the product opportunity matrix resulted in five product categories being selected for further evaluation. These categories include:

Odor Control

A potentially huge market exists for EM as a livestock odor control product, particularly in hog operations in the Midwest and southern hog producing regions. Odor control requires a minimum of additional research to generate interest among livestock producers.

Compost Inoculant

A large potential market for EM as a commercial compost inoculant in California and other states that are under legal mandates to reduce the amount of biomass deposited in landfills. The use of compost in organic and conventional farming also is increasing. An exciting potential exists to develop an EM compost that would have disease controlling attributes for specific pathogenic problems in American agriculture. Research must verify that EM as a compost inoculant speeds up

the composting process and has proven disease control attributes.

Training and Consulting Services

EM Technologies has conducted a series of EM and Nature Farming Training courses and should build on its training experience and expertise in EM technologies. The company should also develop a consulting business targeted at farmers, crop advisors and agricultural input suppliers, such as seed and fertilizers companies, that have potential uses for EM technology. Training and consulting services can generate immediate cash flow benefits.

Home Garden Products

The market for home gardening products in the United States are extremely large and dynamic. However, this market is also highly competitive and typically requires significant advertising budgets to launch new consumer products. Thus, the focus should be on EM Technologies' new Kitchen Compost Kit, which appears to be a unique product, with a favourable marketing potential.

Soil Inoculant

Soil inoculant potentially offers the largest market application in agriculture for EM microbial technology. The diverse applications as a soil developer, disease suppressant and fertilizer enhancer could enable EM Technologies to tap into the billion-dollar alternative agricultural products market described in this report. However, in American agriculture, significant research is required to enter and capture this market. Thus, the inoculant market should be part of EM Technologies' long-run market development strategy. The following areas are recommended as prime targets for a research focus:

- Karnal bunt disease in wheat
- A replacement for methyl bromide in strawberries.
- An emergence and growth stimulator in rice.
- A disease and thatch management tool in turf grass.
- A source of microorganisms and fertility in the nursery and container plant industries.

Phase II: Products and Markets Targeted by the Marketing Plan

The draft marketing plan recommended that EM Technologies, Inc focus its primary resources on the odor control application of EM, the EM Kitchen Composter, commercial composting and EM training programmes.

A. Odor Control Product

1. Basis for Targeting

The odor control product should be a top priority of EM Technologies, Inc.'s marketing plan. There is a strong and urgent need to solve the odor problem in the major hog production regions of the United States. The pressure of communities who do not want to tolerate hog odors has resulted in the passage of legislation and regulations that may restrict the operations of medium and large scale hog operations generating significant amounts of noxious odors. Concern with animal and worker health resulting from the conditions that create odors is also a driving concern. A major trend occurring in the US hog industry is increasing consolidation among producers. These larger units create a more urgent odor problem given the concentration of animals. Thus, there is growing market for hog odor control products.

An important advantage of EM Technologies, Inc.'s odor control application of EM is that it has been tested and used in Japan and elsewhere for up to ten years by swine, dairy and poultry operations. The data from these investigations and demonstrations of EM for odor control should be translated into English and used in the marketing of the product in the United States. In addition, Iowa State University and North Carolina State University have established hog odor testing programmes that will evaluate the effectiveness of commercial products. The testing programmes are comparatively inexpensive and readily available. Thus, EM Technologies, Inc. does not need to invest substantial amounts in creating university-based trials to show the efficacy of its products. The results of the earlier research and positive test results at either the Iowa or North Carolina testing programmes would be adequate to launch an active marketing programme in the United

States for EM Technologies, Inc.'s odor control product.

The report identified the following criteria as critical to the success of a hog odor control product:

- (i) The product needs to be highly and demonstrably effective in reducing manure odors to counter skepticism by growers who have tried other products.
- (ii) The product should have secondary benefits, such as enhanced manure quality or improved livestock health, to provide clear tangible value to growers.
- (iii) The product needs to be cost effective and highly price competitive with other odor control systems and products.

EM products meet all these criteria, and, thus, there is an opportunity to penetrate the market.

2. Size of Market and Growth Trends

The current market in the United States for odor control products, including feed-through, pit and lagoon additives, is estimated at \$4.1 million. Industry sources estimate that the market has been growing at an annual rate of more than 10 percent. The potential market for odor control products, assuming all confinement operations use some form of odor control, would amount to \$ 23 million. Thus, there is opportunity for substantial growth during the next two to five years as continuing public and regulatory pressures force hog growers and other livestock producers to reduce the odor emissions of their operations. The report projects that the growth rate could range from 11 percent to 23 percent per year during the next five years.

3. Marketing Plan

The recommendations of the marketing plan are presented in summary form as follows:

- a. Market the odor control product as a customized formulation of extended EM that will be used as a spray to clean hog facilities, as an additive to manure storage tanks and lagoons, and market a separate product as a probiotic to be mixed with the drinking water or used to make EM Bokashi as a feed additive
- b. In the marketing campaign, emphasize both the odor control characteristics of EM and the secondary benefits, such as enhanced animal health and feed performance.
- c. Translate into English the results of product testing in Japan and elsewhere for use in the US marketing campaign.
- d. Test EM at the Iowa State testing programme.
- e. Establish relationships with "pioneer cooperators" in Arizona, Utah, Texas and Iowa to develop application procedures under varied hog raising conditions and show the on-farm effectiveness of the product to be used on the marketing campaign.
- f. Price the EM odor control product so that the final price to growers averages \$.05 to \$.10 per finished pig: this would make EM Technologies, Inc.'s product highly competitive.
- g. Focus the initial marketing effort on leading medium and large scale hog operations in Iowa, the largest hog producing state, center of 75 percent of US production, and a state where swine operators are facing tough environmental regulations.
- h. Develop a direct marketing mailing campaign based on geodemographic segmentation aimed at the most progressive growers to avoid the high cost of a conventional ag input marketing effort; the mailing campaign will initially focus on 1000 hog farmers including medium and large producers, Iowa Master Pork Producers, breeder operations and progressive growers.
- i. If the direct marketing campaign is successful, expand it to neighboring states during the second and third years of operations.
- j. Establish contact with one of the major marketing cooperatives or ag distribution companies in the Midwest to leave open the option of pursuing conventional distribution if the direct marketing campaign falters or to ramp up distribution throughout the Midwest rapidly; the report presents profiles of the leading companies including Cenex/Land-O-Lakes, Farmland Industries, Kent Feeds and Moorman Feed.

- k. Hire and support an Odor Products Technical Director who would provide technical support for the testing of the product, and work with EM Technologies, Inc.'s cooperators and customers
- l. Limit the advertising budget to publications in Iowa during the initial year of marketing; however the budget would be expanded gradually during year two and three as sales are expanded to neighboring states.

4. Budget and Projections

Marketing budgets for the first three years of operations are presented in the marketing plan. The total marketing budget averages approximately \$180,000 during the first three years. The projected revenues increase from \$90,000 in the first year to \$400,000 in the third year. The company would sustain a loss of \$132,400 in the first year and a profit of \$40,000 during the third year. The long run potential for revenue and profit growth of the odor control product is excellent. The potential market for odor control products in the hog industry could reach its potential of \$22.9 million within ten years if it grows at 19 percent to 20 percent per year. A 5 percent share of the market by EM Technologies, Inc. would produce sales of \$1.15 million and profits of \$450,000. A 10 percent market share would produce revenues \$2.3 million and profits of \$1.08 million. An expansion to other livestock industries, such as dairy and poultry, that also have odor problems, offers the potential of substantial cash flow and profits for EM Technologies, Inc. from the odor control product line.

5. Opportunities and Risks

The major opportunities for EM as an odor control product are:

- Participation in an environmentally important product and rapidly growing market;
- The minimum investment required to verify the effectiveness of the product;
- Significant long run revenue, cash flow and profits.

The major risks associated with the development of EM Technologies, Inc.'s odor control product are:

- The product might produce poor results in the Iowa State University testing program thus setting back the marketing programme and requiring more expensive additional testing;
- The large number of competitor products already on the market.

B. EM Kitchen Composter

1. Basis for Targeting

The EM Kitchen Composter is also an important priority for EM Technologies, Inc.'s marketing plan. The EM Composter is a unique product, given its microbial component and attractive design, that should appeal to the growing market for compost buckets and bins.

The primary reason for targeting the Kitchen Composter is that a successful marketing campaign through garden catalogs and magazines could result in substantial sales of the product to home gardeners. The high margins on the sale of the product of approximately \$30 per unit will generate substantial cash flow and profits. These funds can be used to support the research and development effort required to introduce EM Technologies, Inc.'s inoculant products to American agriculture.

The marketing plan also recommends that EM Technologies, Inc. market the Kitchen Composter to the rapidly expanding home composting training programmes financed by local county and municipal governments in Arizona, Texas and California. The incorporation of the Kitchen Composter to these programmes will promote EM Technologies, Inc.'s objective of serving community agriculture and offering educational programmes.

2. Size of Market and Growth Trends

The commercial and home composting market is growing rapidly due to the need of municipalities to reduce the flow of organic waste to landfills and the interest of gardeners in participating in

recycling and producing organic fruits and vegetables. Eleven counties in California, four counties in Texas and two counties in Arizona have started community education programmes to promote and support home composting.

The growth in home gardening is reflected in the average 9 percent rate of growth in the sale of lawn and garden products between 1968 and 1996 when sales increased from \$3.8 billion to \$71.9 billion. The National Gardening Association estimates that 72 million households participated in gardening activities in 1994. Thus, gardening is a major recreational activity in the United States and a huge market for products that improve gardening practices. Organic Gardening magazine estimates that 27 million Americans purchase compost. It is estimated that 13.5 million gardeners are making their own compost. Retail gardening stores and catalogs now offer a wide range of composting bins, books and tools for composting that were not offered as recently as five years ago. Fifty-nine and seventy-five percent of the readers of Horticulture and national Gardening magazines are active composters. One survey showed that 46 percent of the composters use a barrel, bin or drum in their composting. Thus, the market for compost paraphernalia is large and growing. However, there are no hard numbers available on the total size of the market for composting equipment and supplies. This report estimates that the total potential market for in-house kitchen composters could be as large as 2-3 million units.

Seventy-one percent of the home composting programmes surveyed for the marketing plan offer bins to participants free, at cost or at a subsidized price. The marketing plan projects that the total home composting training concept could eventually reach 261,000 participants in California, 189,000 in Texas and 42,000 in Arizona. The plan projects that EM Technologies, Inc. can probably capture 10 percent of the market resulting in sales of approximately 50,000 composters per year over a ten year period.

3. Marketing Plan

The marketing plan is presented in summary form as follows:

- a. The EM Kitchen Composter should be designed as two 2.5 gallon nesting buckets to fit easily into most kitchens and allow the user to have collection capacity at all times.
- b. EM Technologies, Inc. should target two major groups for its Kitchen Composter a) home gardeners who will purchase it through upscale catalogs and advertisements in the leading gardening magazines, and b) home composting training programmes that will integrate the composter into their composting procedures.
- c. The Kitchen Composter should be priced in a range equivalent to the most similar products on the market, which are worm bins. Thus, a retail price of \$35 to \$40 for sales through catalogs and magazines is recommended. The selling price to the home composting training programmes should be \$15 to 20 per unit.
- d. The EM Kitchen Composter should be marketed to the leading home gardening catalogs including Gardener's Supply, Smith & Hawken, Seventh Generation, Gardener's Eden and Real Goods. Profiles of the leading catalogs and recommendations on how to approach these companies are provided in the marketing plan.
- e. EM Technologies, Inc. should advertise the Kitchen Composter in the leading gardening magazines such as Flower & Garden, Sunset, Organic Gardening, Horticulture and National Gardening; the advertising in these magazines should lead to direct sales to the readership of the magazines, and will also support the sales of Composters through the home gardening catalogs, given the overlap of readership between the gardening magazines and the catalogs.
- f. The recommended advertising budget in gardening magazines increases from \$92,000 in Year I to \$185,000 in year 3. The advertising expenditures should be expanded gradually, and only if substantial sales of the Kitchen Composter result from the initial advertising campaign.

- g. A professional publicist should be engaged to write and place promotional articles about the Kitchen Composter in selected gardening magazines.
- h. The marketing effort for the sales of Kitchen Composters to home composting programmes should focus on country and city programmes in Arizona, Texas and California.
- i. EM Technologies, Inc. should prepare a packet of information about the Composter which should be distributed to catalogs and the directors and purchasing agents for the training programmes.
- j. EM Technologies, Inc. should also attempt to conduct local demonstration projects on the effectiveness of the Bokashi starter inoculant and participate in the training component of the programmes.
- k. EM should consider utilizing graduates of the company's training programmes to work as sales consultants and trainers with community programmes in their areas; in return the graduates could earn a commission on the sale of Composters.

4. Budgets and Projections

The marketing plan presents a three year budget for the sales and marketing expenses of the EM Kitchen Composter. Marketing expenses, primarily advertising, rise from \$152,000 in the first year to \$244,000 in the third year. The total sales of Composters is projected to increase from 5,800 units in the first year to 13,200 units in the third year. The projected revenues rise from \$309,000 in the first year to \$858,000 in the third year. It is interesting to note that the sale of Bokashi as a starter is a substantial portion of sales rising from 35 percent of total sales in the first year to 60 percent of total sales in the third year. Profit or cash flow increases from approximately \$300,000 in year one to \$858,000 in year three. Thus, the Kitchen Composter has the potential of generating substantial cash flow for EM Technologies, Inc..

5. Opportunities and Risks

The major opportunities for EM Technologies, Inc.'s Kitchen Composter are:

- To generate substantial cash flows and profits;
- To educate gardeners about the benefits of home composting and participate in community gardening and compost training programmes;
- To introduce home gardeners to the compost use of EM and Bokashi which could interest them in other applications of EM.

The major risks associated with the development of EM Technologies, Inc.'s Kitchen Composter are:

- The Kitchen Composter product and marketing through upscale catalogs and gardening magazines involves retail consumer marketing; with such products there is the possibility that the product will not catch the consumers' interest and that projected sales will not occur;
- Most directors of home composting training programmes do not recommend the use of inoculants for composting.

C. Training Programmes

1. Basis for Targeting

The training and consulting services are an important element of EM Technologies, Inc.'s strategic development and marketing activities. The training programmes build on EM Technologies, Inc.'s past and current training activities and thus capitalize on one of the strengths of the company. The training programmes will not generate substantial revenues and cash flows. However, the training programmes are an important means by which EM Technologies, Inc. can promote its ideas, the philosophy of Nature Farming and the use of EM, Bokashi and related products. An important element of the company's mission is to educate gardeners, farmers and the general public in biorational food and fiber production.

The training and consulting programmes should also be structures and targets to directly support the sales of the company's targeted products. Thus, the initial training programmes and workshops should focus on the control of animal odors and home composting.

2. Growth Trend

The size of the market in the United States for training programmes involving organic, sustainable and biorational agriculture is impossible to determine. There are more than 150 organizations in the United States that offer educational and training programmes in sustainable agriculture. The marketing plan projects that the demand for such programmes will increase significantly as farmers shift from chemical-based farming to biological farming. Growers that are interested in these new technologies prefer to learn through workshops.

The report profiles the leading providers of training programmes that have been successful during the last five to ten years and that offer programmes similar to what EM Technologies, Inc. offers. These organizations include the Lubke Workshops and Permaculture Workshops.

3. Marketing Plan

- a. The training programme should focus on the general background of Nature Farming and the theory and practical use of the company's microbial products; these training sessions would be a continuation of the company's training programmes during the last several years;
- b. EM Technologies, Inc. should develop specific training programmes that are targeted at the use of EM for odor control and home and commercial composting; these programmes would be an integral component of the company's marketing effort for odor control and composting products, and would provide technical support to the company's customers who buy these products;
- c. The pricing of the training programmes should be competitive with the Lubke and Permaculture programmes and amount to approximately \$200 per day for 1-2 day intensive workshops;
- d. The training programmes will be marketed to hog farmers, growers and participants in the county-based home composting sessions; EM Technologies, Inc.'s odor control technical director should also participate in industry conferences, giving brief presentations and seminars that promote the training programmes;
- e. The company should also place articles and advertising in selected publications such as Farmer to Farmer, California Certified Organic Farmers-Statewide Newsletter, Composting News, BioCycle Magazine, The IPM Practitioner and Harmonious Technologies.

4. Budgets and Projections

The projected budgets are based on the assumption that EM Technologies, Inc. will hold six product oriented training workshops during the first year of marketing. The number of workshops will be increased to eighteen by the third year. The total revenues from product oriented workshop increases from \$12,000 in the first year to \$36,000 in the third year. New profit from the revenues increases from \$2,000 in year one to \$10,000 in year 3. Revenues from the current general type of workshop on EM and Nature Farming are not included in these projections, The total revenues and cash flow generated by the training workshops are modest during the first three years. However, in the long run, as EM Technologies, Inc. expands the application of EM through its research programme, the number of workshops and the associated revenues could increase significantly.

5. Opportunities and Risks

The major opportunities for EM Technologies, Inc. training programmes are:

- The opportunity to promote the company's overall philosophy and the use of EM products;

- Support the marketing of targeted products such as odor control and the Kitchen Composter. There are no major risks associated with the development of the training programmes.

D. Compost Inoculants

The marketing plan does not recommend the sale of compost inoculants as a major market for EM Technologies, Inc.'s inoculants during the three year planning period. The primary reason behind this recommendation is the market for inoculants appears to be extremely small. This is true despite the large and growing overall market for commercial composts.

The analysis of the compost market did indicate that there is an emerging market for the use of compost as a carrier for selected microbial inoculants that have specific disease suppressive properties. This market, would fit well with EM's disease suppressive characteristics. However, in order to market the product to commercial growers, it will be necessary to verify through university-based research and field trials the effectiveness of EM compost against specific pathogenic organisms that cause major crop damage.

The California Integrated Waste Management Board estimates that growers in California purchased 453,000 tons of compost in 1995. A BioCycle report indicated that an estimated 50 million tons of green municipal waste are generated annually, of which 2 million tons are currently composted and used by horticultural industries. A 1994 USDA survey indicated that 61 percent of organic growers use compost for nutrient management. It is estimated that the demand for compost will expand at an annual rate of 10 percent or more during the next five to ten years as organic acreage throughout the United States expands. Thus, there is a significant and expanding market for compost.

However, very few of the managers of commercial compost operations that were interviewed for this study indicated that they used commercial inoculants as starters. Generally these operations add cured compost to a new batch of material. The cost of the commercial inoculants can increase the production costs of the finished compost by as much as 20 percent. Because most operators do not see any advantage in using the commercial starters, they decide not to use them. The lack of use of commercial starters is partially driven by the reality that a large portion of the total volume of commercial composts is made from urban green waste that is ultimately used as a mulch in municipal, commercial and private landscaping. The manufacturers and customers of this product are not highly concerned with the quality of the compost. Thus, the potential enhanced value of the inoculated compost is not an important consideration for operators.

A number of researchers in the US are working on the disease suppressive potential of inoculated composts. The application of disease suppressive composts has the greatest potential in high value horticultural crops such as strawberries and nursery crops.

The marketing plan recommends that EM Technologies, Inc. establish research and compost trials with several pioneer cooperators who operate farms that produce horticultural crops. The report also recommends that EM Technologies, Inc. sponsor university research on the disease suppressive abilities of EM inoculants. There is a substantial long run market in the use of compost for disease control. However, it is currently too early to begin exploiting the market.

E. Development of EM Technologies, Inc.'s Marketing Management Organization and Auxiliary Support Activities

1. Marketing Team

The implementation of the marketing plan will require EM Technologies, Inc. to expand and develop its marketing staff and organization. The marketing plan recommends that the company create four positions to implement the marketing of the odor control, EM Kitchen Composter and training products. The positions are Marketing Director, Sales Manager, Odor Products Technical Coordinator and Assistant Sales Manager. These managers would work closely with the President and the Technical Coordinator of EM Technologies, Inc. to develop and implement the company's marketing strategy.

The responsibilities and recommended backgrounds of these managers are described in detail in the

marketing plan. The Marketing Director, Sales Manager and Assistant Sales Manager would spend approximately equal portions of their time between the development of marketing plans, the odor control product and the Kitchen Composter. A small part of the time would also be spent on the development and marketing of the training programmes.

The Odor Products Technical Manager should work full time on the odor control products planning research, developing technical materials, managing relationship with the company's research projects and pioneer cooperators and selling to the larger corporate farms.

The plan recommends that the Marketing Director and Sales Manager, who can directly affect sales, should be remunerated on the basis of a combination of base salary and performance incentive.

2. Website

The marketing plan strongly recommends that EM Technologies, Inc. develop a website that would be used for marketing and client service. Each of the targeted products should have a separate page on the site that provides technical, pricing, ordering and delivery information. The website would enable EM Technologies, Inc. to link together, through information flows and feedback, all of the participants that are critical to the companies long-run success, including staff, customers, researchers, pioneer cooperators, participants in workshops and the general public.

3. Trainee Network

The marketing plan recommends that EM Technologies, Inc. consider utilizing the emerging and expanding network of graduates of EM training sessions in the marketing and technical support of the company's products. EM Technologies, Inc. needs to carefully screen training programme graduates to identify those who have the real capability and interest to function as demonstration farmers, sales representatives, or as technical support.

4. Recommended Research and Development Activities

The long-term activities of EM Technologies, Inc. will involve the development, promotion and marketing of the EM inoculants for a wide variety of soil development and pest control uses. It is through the inoculant products that EM Technologies, Inc. will tap into the merging billion dollar market for biorational products described in the marketing study.

However, in order to generate sales of the inoculant products to growers in the United States, it is necessary to verify through university and on-farm research the effectiveness of the company's products. Thus, the marketing plan recommends that EM Technologies, Inc. undertake an aggressive research program, targeted at specific applications of EM such as disease control in crops and livestock, with agricultural universities in the United States. The research should be closely coordinated with the advanced research that has been conducted by Dr. Higa in Japan.

The marketing plan identifies several potential research topics that could enable EM to solve specific and significant problems in US and world agriculture. These include a solution to the Karnal Bunt disease in wheat research on a replacement for methyl bromide for a variety of crops, and the use of EM as a control for fungus diseases and straw management in rice. Research on the use of EM to enhance the breakdown of cover crops and crop residues is also recommended.

The marketing plan recommends that EM budget at least \$50,000 per year in university research. Such an amount would support significant research on two to three of the targeted projects. The level of the investment in the future of EM Technologies, Inc. needs to be determined by the company's management and board of directors.

5. The Consolidated Marketing Budget

The marketing plan presents a consolidated marketing budget that integrates the budgets for the targeted products, and also includes selected overhead expenses that are common to all products, such as employee benefits and the website. The budget does not include the salaries of the President, the Technical Director or other staff persons not directly involved in the marketing of the targeted

products, EM Technologies, Inc.'s revenues from the targeted products are projected to increase from \$410,000 in the first full year to implementation of the marketing plan to \$1.3 million in the third year. The manufacturing cost for the targeted products are included in the budget based on information provided by management. The budget also contains research expenditure of \$50,000 per year.

The projections indicate a negative cash flow of \$118,000 in the first year of the marketing plan. The negative cash flow needs to be viewed as an investment in the future of the company that is essential to develop and market products that will generate long term profits and meet the company's goals. The projections indicate that the company will generate positive cash flow from the sale of the targeted products of \$235,000 in the second year and \$663,000 in the third year of the marketing plan. These cash flows are highly dependent on the success of the EM Kitchen Composter. If this product is less successful than projected, cash flow would be reduced which may require further investment.