

A CASE STUDY : BIOCYCLE (HK) LTD.

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BIOCYCLE (HK) LTD.

*“Other than a mere business, it is our aim to enter into a long-term
commitment to build up a world that we want to live in, a world as splendid
and attractive for future generations as in the past and present.”*

— Daniel R. Heyer, CEO, EPC Group of Companies

Introduction

In 2000, Harry Cheung, Director of BioCycle (HK) Ltd. was reflecting upon the company's growth in the past 9 years. 2001 would mark BioCycle's 10th anniversary, but

Harry, who had worked for the company since its establishment in 1991, still vividly recalled the moment when he joined the firm.

After struggling for 9 years, BioCycle first showed a positive bottom line in 1999, with a sales level of HK\$10,000,000. This was a 30 percent growth on the sales level in 1998, yet Harry was still dissatisfied with the figures. He confidently predicted a further 40 percent growth in sales in 2000 based on the uniqueness of their products and the growing environmental and safety concerns of Hong Kong people.

BioCycle now offers both professional pest control services and retail products to Hong Kong and Macau. It holds the marketing and distribution rights in Hong Kong and Macau for BioKill® pesticide, which is the only insecticide available in these areas that is safe for human beings, animals and the environment.

Currently, BioCycle accounts for 10 percent of the household pesticide retail market in Hong Kong, compared to the 30 percent market share held by their competitor “Baygon®”. It is doubtful whether Hong Kong people would be willing to pay a premium-charged price for an environmentally friendly pesticide. A great deal of consumer education would have to be carried out before establishing whether Harry has been over-optimistic in his projection.

Inside a typical supermarket or grocery store in Hong Kong, it is not easy to find BioKill®. Harry admits that the existing distribution operation, carried out by Asia Network Ltd., is a major concern. Another possible risk is the emergence of unpredictable potential competitors. A completely new, safe and environmentally friendly low-priced pesticide could be launched unexpectedly in this technologically fast-changing world.

In the hope of outperforming competitors by continuous improvement, BioCycle is struggling for ISO 14000 certification. This is an extremely difficult task, as Harry states:

“There are no specific guidelines in ISO 14000 for the pest control services that we provide. We will have to wait and see what is required.”

History

For years, there has been a conflict in insecticide development between efficacy against insect pests and the safety of humans and the environment. With the aim of developing environmentally friendly products that combined exceptional efficacy with increased safety benefits for man and animals, the *Jesmond Group of Companies*, a European based group with headquarters near Zurich, Switzerland, was established in 1985. Under the Group’s BioKill® trademark, *Jesmond* developed and manufactured proprietary, multipurpose, water-based insecticides and marketed them in both retail and industrial environments in more than 30 countries throughout the world.

Expansion to Other Countries

Apart from continuing to capitalize on its product technology with the development of safer and more effective insecticides, the Group pursued its expansion into other European countries such as Finland, France and Italy, and later to the US and Canada, by forming partnerships with local agencies (*Figure 1*). BioKill® products were able to capture the

market's awareness in Europe and the US where people had already been concerned about environmental protection issues, such as ozone-layer depletion, and personal health problems, like cancer, for a long time. Walking down the streets in those European countries, it would be easy to find a BioKill® retail outlet.

Expansion to Asian Countries

With such a satisfying success, BioKill® looked for other opportunities to expand. Aware of tropical areas like Hong Kong, Singapore, Thailand and the Philippines, where insects prevail, BioKill® decided to enter the Asian market. In 1991, in response to the fast-paced economic developments and the related changing pattern in consumer behavior, BioCycle was founded to promote environmentally friendly Pest Control Services to the people of Hong Kong.

To deal with such a huge Asian market, BioCycle decided to have its establishment in Hong Kong as the entry point since Hong Kong had the best developed economy in Asia at that time. Along with the highest education level, Hong Kong people were more aware of environmental problems and more able to afford the premium-charged services and products. Being an industrialized city, there are lots more have to be done on the polluted environment in Hong Kong. The close link with China also encouraged BioCycle to establish in Hong Kong since they foresaw an opportunity to enter the market of a 1.2 billion population.

In 1999, BioKill® products were also marketed in the Philippines, Singapore, and China by the EPC Group, the Mother Company of BioCycle. In order to facilitate the services and product distribution in China, two offices were set up in Guangzhou and Shanghai.

BioCycle (HK) Ltd.

BioCycle was the first operational company of today's EPC Group of Companies. It was originally named BioKill HK Ltd., which provided pest control services in Hong Kong in 1991 and started the BioKill® pesticides retailing business in 1994. Initially, BioCycle also produced its own pesticides and sold the bottles to the retail stores. In order to achieve greater efficiency, the final group structure was put in place in August 1995 and the businesses were separated into: Manufacturing and Exportation (Ecological Product Corporation Ltd.), Wholesales & Distribution in Hong Kong (Asia Network Ltd.) and Services and Consulting in Hong Kong (BioCycle (HK) Ltd.) (*Figure 2*).

The EPC Group was founded with the aim of introducing ecologically safe services, technologies and products to Hong Kong and the Asian-Pacific market. It now acts as a manufacturer and exporter under license from various European and Australian companies, formulates and/or bottles and/or markets a variety of products, including BioKill® from Switzerland (*Figure 3*). The group has so far invested over \$3 million (*Figure 4*) in the building of the companies and is determined to further invest in new innovative environmental projects, products and services in the future.

Another member of the EPC Group, Asia Network Ltd., was established in December 1995 and is the wholesaler and distributor of the group's own products and complementary food products imported from Europe and other Asian countries. It comprises two divisions: Ecological Products and Food Products and it also distributes BioKill®.

Visiting the green-painted offices of BioCycle, one can see how environmentally friendly the company is. With more than 30 employees now, the company uses energy-saving light bulbs, exercises double-sided printing, recycles paper and cans, and organizes an internal committee to participate in environment protection activities like a tree-planting campaign. With a mission to provide technology and innovation to improve the environment and human living conditions (*Figure 5*), BioCycle specializes in providing safe and environmentally friendly Pest Control Services using exclusively biodegradable products that are safe for humans, animals and plants. It is the sole retainer and manufacturer of BioKill® and it also operates a dilution facility in Kowloon Bay in Hong Kong, where all concentrated BioKill® manufactured in Switzerland is diluted before being sold in Hong Kong.

The development of BioCycle has been difficult. It has incurred losses in the past 9 years and only became profitable last year. Due to the more conservative European way of doing business, BioCycle did not spend much on advertising and promotion and, therefore, the profile of the BioKill® brand has increased very slowly in Hong Kong. Many people in Hong Kong are still unaware of the product. BioCycle, however, is firm on its own philosophy and believes that breaking the pests' breeding cycles, through initial applications conducted at shorter intervals and followed up by regular maintenance sprays, is the only way to kill the pests completely. They therefore reject all requests for a one-time spray.

Product Information

BioCycle now offers Pest Control Services, Termite Control Services and Cleaning Services, and retail products including BioKill® Original, BioKill® Extra, BioCare, BioClean, BioWood™ and BioVin.

Retail Products

All BioCycle's products are non-toxic. They are safe for human beings and animals and are fully biodegradable. The most successful products are BioKill® Original, BioKill® Extra and BioCare.

What is BioKill®?

BioKill® is one of the few products that is not required to carry the "Poison" label, according to the Fisheries and Agriculture department in Hong Kong, and it has undergone innumerable tests to ensure its safety. BioKill®'s active ingredient, Permethrin, is a sophisticated synthetic chemical that takes its origins from Pyrethrum. It is the only pesticide that has the appropriate chemical combination in the synthetic Permethrin able to remain active for several weeks and, in some cases, months, yet at a toxicity level that makes it completely safe for humans, animals and plants. This factor is responsible for maintaining BioKill®'s unique position in the market and enabling it to withstand competition.

Mode of Action / Kill Effect

BioKill®'s active ingredient diffuses into the highly permeable membranes, through which insects ventilate oxygen, and enters the bodies of all cold-blooded organisms (*Figure 6*), thus allowing BioKill® to be absorbed easily. Since the hydrolytic enzymes work much more slowly within cold-blooded organisms than in mammals or birds, insects are not able

to degrade the active ingredient quickly enough. The substance then attacks the central nervous system and results in total muscle exhaustion and paralysis, leading to death.

Why Safe to Mammals?

As BioKill® enters the biological systems of warm-blooded organisms, it is safely broken down by two protective mechanisms: permeability and hydrolysis. Firstly, warm-blooded organisms are usually protected by skin that does not allow BioKill® to pass through. Even if it enters the body through inhalation or accidental swallowing, it is rapidly absorbed and broken down by highly active enzymes. It is therefore safe for both mankind and the environment. Conversely, when other types of insecticides are inhaled or ingested into human bodies, they are less readily broken down and could even accumulate.

Strengths of BioKill®

BioKill® is completely safe for all warm-blooded organisms and is effective against all cold-blooded insect pests. It is exempted from displaying a "Poison" warning in Hong Kong and other countries around the world. It is also odorless and leaves no stains on textiles, wallpaper etc. Its long-lasting effect is unique and can remain for several weeks, or longer, due to its persistence on synthetic surfaces which creates an efficient residual effect. In environmental terms, it is biodegradable and does not have any biological accumulation effect, which makes it safer to enter the food chain (*Figure 7*). BioKill® contains no highly combustible propane / butane gas which damages the ozone layer and no aerosols which unnecessarily burden the air in a room with insecticides. The bottles are reusable and are made of eco-friendly material with a practical and dependable pump spray which can be re-used. When comparing BioKill® products with other ordinary products, the benefits of BioKill® are even more outstanding. (*Figure 8*)

Drawbacks of BioKill®

The killing time of BioKill® is longer compared to many traditional insecticides. It generally takes about five to ten minutes to kill cockroaches which is a serious problem in Hong Kong, where people value speed. In addition, because of its higher production costs, BioKill® is charged at a premium price of about \$49.80 for a bottle of 500ml while it is about \$33.90 for a competitor's 560 ml bottle (*Figure 9*).

Product Launch

BioCycle first introduced BioKill® Original in 1992 and later released BioKill® Extra in 1995 in Hong Kong. BioKill® Regular is still its mainstream product for all household applications. BioKill® Extra is an improved version and lasts up to 6 months, hence it is a product which is more suitable for problematic areas like food production, warehousing, hotels, outside applications and other highly problematic and sensitive areas.

Another BioKill® product is BioCare, which is a safe and ecological insect spray that effectively eradicates ticks, fleas, mist fleas, mites and other parasites found on pets. Due to its gentle nature, it does not affect the pets in any way even when licking the product. The product is safe for humans and warm-blooded animals, but like other BioKill®, it is highly toxic to fish, reptiles and other cold-blooded animals. BioCare has been tested under LD50 tests (*Figure 10*), which is an internationally accepted standard for measuring toxicity of products. BioCare's LD50 is beyond measurement, that means that under laboratory conditions, it was not possible to measure the toxicity of it for humans and pets.

Services

Apart from the retail products promoted to the general public, BioCycle also offers pest control services. It is a comprehensive and professional pest control service against surface insects, termites and rodents for different market segments including domestic, commercial (offices), manufacturing and production, storage & warehousing, health-related (hospitals, elderly homes etc.) and educational (schools and kindergartens). In terms of the domestic clients, health-conscious and environmentally aware families with one to two children would be BioCycle's main targets. They, typically, have a monthly household income of more than \$50,000 that enables them to afford the premium-charged services.

The service is applied using scientific methodology that follows the principle of breaking the pests' breeding cycles through initial applications conducted at shorter intervals first, then followed up by regular three-dimensional (3D) maintenance sprays, in order to eradicate insects and pests effectively and permanently. Besides handling common pest problems such as cockroaches, mosquitoes and ants, BioCycle also specializes in specific pest problems such as termites, weevils, mites and rodents. BioCycle uses BioKill® as the pesticide for carrying out all the services except mice killing since BioKill® would not work on mammals.

Before carrying out the service, BioCycle would first sign a contract with the clients, stating how many times spraying has to be done during the year and what payment will be required in advance. A typical contract usually includes five sprayings per year and BioCare would offer a warranty extending beyond the end of the contract. The pricing of the service depends on the size of the accommodation. A typical flat of 500 sq feet costs about \$1700 per year (*Figure 11*).

In the early stages of establishment, BioCycle focused on the expatriate community and foreign enterprises that were more concerned about the environment and had been used to safe and ecologically sound pest control services. Later, they shifted the focus to the local client. Initially, people were not willing to accept BioCycle's 3D spraying because they believed that BioKill® would not be safe enough, because of BioKill®'s slow killing method, they still preferred the immediate killing effects of other types of pesticide. Moreover, BioCare would not offer one-time services but would rather act as a consultant to advise clients on how much spraying had to be carried out in order to kill the pests effectively. These issues hindered BioCare's growth because Hong Kong people like to try services before signing a contract.

BioCare has gradually begun to expand its client-base since it is practically the only choice for many food production firms and many highly sensitive business sectors in Hong Kong. Word-of-mouth promotion is particularly effective in the Hong Kong domestic sector. Today, the neighborhood of a family that currently uses the BioCare services will become BioCare's client tomorrow. The growth in the sales of these services is satisfactory and could be expected to continue since there are no direct competitors in the market. More and more enterprises are tending to contract out their pest control services to professional third parties. However, the market share of BioCycle's current pest control services is unknown since the market size is hard to define and is always fluctuating.

Product Distribution

Asia Network Limited, under the umbrella of BioCycle Limited, is the wholesaler and distributor of the Group's own products. It has capital of about HK\$500,000, accounting for a 20 percent share of the capital of the group companies.

When compared with the distribution channel employed by competitors, BioKill® is at a disadvantage. BioKill® products can be found in some of the large Japanese supermarket chains like Jusco and UNY as well as personal care stores like Manning's, but the market share of BioKill® products is around 10 percent.

Wellcome Supermarket and Park'N Shop are the supermarket chains with the highest sales in Hong Kong. They have a large number of outlets, wide geographical coverage and are able to reach a large percentage of the population. Besides going to the outlets to shop, orders can be taken by phone or fax, and even on the Internet. The growing popularity of Internet buying has prompted the two chains to develop a portal for that purpose. BioKill® products, though, are very difficult to find, in both the Wellcome and Park'N Shop grocery stores and in the Internet portal developed by the two supermarket chains. The coverage of Japanese supermarkets is not as broad as the giant supermarket chains, but they are able to concentrate on newly established communities and are welcomed by young people or couples with middle to high income.

BioKill®'s major competitor, Baygon®, has a healthy and an extensive distribution network and has a high penetration rate in the retail chains. Its product can be found in almost all grocery stores, covering all the outlets that BioKill® is employing. Even small dispensary stores or personal stores carry Baygon®. These stores, selling pharmaceutical, household, skin care and milk powder products, are scattered all over the city and they make Baygon®'s products highly visible in the market and in the consumer's mind.

In addition to the problem with distribution channels, BioKill® is also facing problems in managing its inventory. As the popularity of BioKill® has grown in these few recent years, the demand has increased and the stocks of the products have run out from time to time. The distributor, Asia Network Limited, found the product to be in short supply and thus could not supply to existing distribution partners.

Promotion

The company puts the emphasis on below-the-line advertising rather than massive communication. 5% to 10% of total sales are allocated to promotional activities. One of the company missions is to be a good example of how to manage natural resources, recycle products and treat the environment, enabling the subsidiaries to use an educational approach in reaching the customers.

To promote its service and products, BioCycle believes personal selling is the most important way of communication. Targeting the high income and educated domestic clients, offices, manufacturing and production plants, health-related sector and educational sector, BioCycle will first give its client a brief introduction to the service and, at the same time, explain its environmentally friendly product features. A team of sales people will promote the product by targeting the firms that are serious about environmental protection and pollution, or are concerned about product safety and potential dangers to humans or pets. The customer base is building up gradually. Word-of-mouth is another important part

of the company's promotional mix. Quite a large number of customers know about BioKill®'s service through personal referral.

BioKill® will also join some exhibitions organized by other bodies when the content of the exhibition is consistent with the company's products and image. The company may, for example, set up a counter in an exhibition on childcare. BioKill® offers a safe method of removing insects to families with small children, who consider safety to be of the utmost importance when choosing an insecticide.

Seminars or talks may do a good job in educating school children on environmental protection and can also promote the company image. Due to tight educational schedules, however, many schools fail to arrange a timeslot for the company to do presentations.

The media that BioKill® uses to promote its brand and products is the Yellow Pages directory and a magazine called Dollar Saver. Yellow Pages is a classified directory that enables the user to find the provider of a particular service or product while Dollar Saver is a magazine targeting foreign expatriates on household shopping. As budget is limited, the company will not expand on the media that it is using, in the short term.

Competition

Currently, there are less than 10 players in the household insecticide market in Hong Kong. (*Figure 12*) The most famous ones include Baygon®, Speedtox®, Raid®, and Fumakiller®, which come from different countries ranging from Germany, U.S., Japan and China. Instead of a general-purpose insect killer for all insects, these brands have a series of products targeting specific insects. For example, Baygon®, the major player which accounts for about 30 percent market share in Hong Kong, emphasizes the customized solution for every insect problem. They separate the insects into different types like flying or crawling insects and advise the customer to use their specially designed insecticides for specific insects. A variety of sizes and forms of killer such as spray and bait station give a broader choice to the customer. Price is similar for all brands, but comparatively, BioKill® is charged somewhat higher because of its unique features.

Most of the brands use instant kill as their selling point. Instead of waiting hours for the insect to die, the insect would be killed immediately after spraying. Products such as the bait station feature the spread of pyrethroid agent to the insects' nests so that the whole nest can be killed. From the customers' perspective, it represents a form of prevention and thus is welcomed.

Although most of the brands claim that their products keep environmental hazards at a minimum, all of them are harmful to plants and are labeled as "Poison". With the unique formula of an environmentally friendly and safe insecticide, BioKill® is now enjoying, a market advantage free from direct competition.

Market Size

As a household necessity, insecticide is kept in almost every home in Hong Kong. The number of households in Hong Kong reached 2,108,000 in 1999 and continues to increase (*Figure 13*). Although hygiene and the sanitary conditions are generally satisfactory, insects are common, especially in summer due to hot and humid weather. Cockroaches and

mosquitoes are the two most commonly seen household insects and most families, especially those with children, are used to having insecticides available.

People in Hong Kong lead busy lives. Although many of them are health-conscious and aware of their quality of life, they usually have no time to search for healthy products. Environmental awareness still remains low in the region compared to the European or American countries. Environmentally friendly products do not gain comparative advantage as they are often charged at a higher price. However, in recent years, because environmental deterioration and pollution have become more serious, people are starting to pay attention to their health. It is expected that people will be more environmentally conscious thus providing a good opportunity for BioKill® to sustain its position in the local market.

What consumers value in a good household insecticide include its convenience of use, safety, speed of killing the insects and an effective lasting period. From this point of view, BioKill® can achieve some of the attributes such as safety and long lasting period, but can not compete with other players in other attributes, particularly speed of killing.

Problem & Conclusion

Despite the success of BioKill®, Harry Cheung faces several problems regarding the future direction of the company. Although the current economic situation in Hong Kong is more stable compared to recent years, it is important to develop a set of strategies that will not only facilitate additional sales and market share, but will also allow the company to maintain the maximum level of flexibility against uncertainties and risks. According to some practitioners in the pesticide and the pest-controlling service field, many companies are taking “environmentallyfriendly” as one of the main objectives in designing their products, services, and even operations. In the near future, it is foreseeable that the competitive environment will become intense or even brutal. Seeing these problems arise, Harry has started developing a set of strategies for the next three to five years.

One of the critical areas that requires attention is the main focus of the company. Currently, most of the income is generated by the pest controlling services (about 70 percent) and the rest (about 30 percent) is produced from the products (BioKill® Original, BioKill® Extra & BioCare). The pest controlling service has performed well in the past and BioCycle has successfully linked with several major corporate clients as well as maintaining a group of premium income residential customers. On the other hand, there are a growing number of environmentally-concerned customers with poor product awareness, which leaves room for development on the product side. Given the limited budget, should Harry continue to focus on pest controlling services or should he concentrate on customer education and brand management?

The company is also facing a dilemma over its marketing position. Although it markets itself as an environmentally friendly company, about 1 percent of the chemicals used for killing rats are actually environmentally unfriendly. Given that there are no specific guidelines in ISO 14001 that address pest controlling services, should the company market itself as “non-toxic” and “natural” (since BioKill® is the only product in Hong Kong that does not have to bear the “Toxic” label) or should it maintain its environmentallyfriendly approach and penetrate for further development (e.g. preparing for ISO 14001)?

Although the company enjoys almost no direct competition in the “non-toxic” pesticide market, Harry does pay close attention to all newly developed products and services. It is not only new entrants who may tap the market with newly developed environmentally friendly products, existing players may also become direct competitors with technological advancement. Should the company become more aggressive in brand development and market share digestion or should it engage in research and development and try to cultivate a new market to avoid direct competition?

Distribution is another problem with regard to consumer access to the products. The company has set up a distribution network consisting of Wellcome, Park’N Shop, Manning’s, UNY, Jusco, etc; nevertheless, it still receives feedback from customers claiming that the product is not accessible in the above locations. Should the company establish new distribution channels or maintain and improve the current distribution channels and inventory levels? Should it set up an online store and build up its own distribution channels?

Customer misunderstanding also frequently arises. For example, customers are doubtful about the efficacy of the product due to its slow rate of killing compared to other pesticides. The customers are also suspicious of the 3D spraying method and the frequency of service required (5 times per year and mistakenly assume that the poison level of the product must be extremely high because of its ability to kill all kinds of cold-blooded creatures. All this confusion and misinterpretation becomes a factor in the lengthy acceptance rate of the product and discourages the market penetration of the company. Should the company rely on word-of-mouth communication as the only promotional channel or should it focus on advertising and public relations activities to achieve the objective?

With so many problems, Harry must consider the importance of every issue before developing the ultimate strategy for the future of BioCycle®.

Appendix

Figure 1: Partners of Jesmond in Other Countries

<u>Countries</u>	<u>Partners</u>
Austria	Pescon GmbH
Belgium	DIA N.V.
Bulgaria	Kamax
Cyprus	Eco Master
Finland	Berner S.A.
France	VIATICK
Germany	Clean Kill & Bio Kill GmbH
Hong Kong, Philippines, Singapore, China	Ecological Products Corp. Ltd.
Hungary	Twindex
Ireland	Bio-Industries, Dublin
Italy	ENPRO Italia S.A.
Korea	Dong Sung Corp. Ltd.
Mauritius	Biocides Environmental Products
Portugal	F. Lima, Lisboa
ENPRO S.A.	Rep. of South Africa
Slovenia	ILIRIJA INC.
Spain	ZELNOVA
Sweden	CTC
Switzerland	ENPRO BioKill® AG
Tschechien	Bioveta a.s.
United Kingdom	Bilaurand
USA & Canada	BEP USA

Figure 2: Organizational Structure of EPC Group

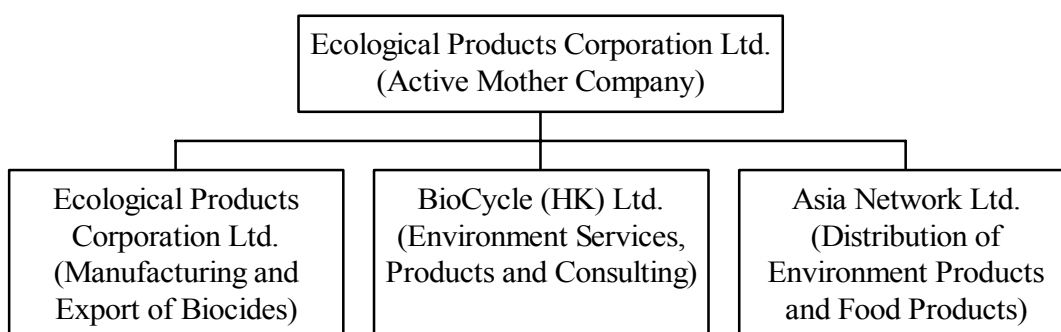


Figure 3: Products of EPC

BioKill®	It is an environmentally friendly and safe insecticide.
BioWood™	This is an organic, environmentally friendly Wood Protector Termicide / Fire Retarder.
Citrox	It is considered to be an organic, environmentally friendly and safe Virocide, Bactericide and Fungicide.
BioClean	It is an organic environmentally friendly and safe detergent for general purpose cleaning.
BioVin	This is an organic, environmentally friendly Soil Improver / Fertilizer.

Figure 4: Share Capital of EPC Group Companies (HK\$)

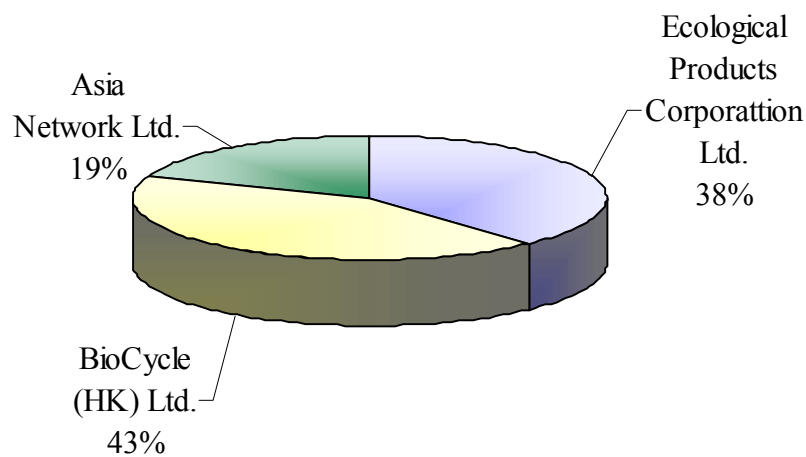


Figure 5: Mission of BioCycle

- We endeavor to bring about new, safe and environmentally friendly technologies and services to Asia.
- We maintain high ethical business standards. We want to be a good example of how to manage natural resources, recycle waste products and treat our environment, pets and wild animals.
- We plead for controlled interference in nature only as and when problems cannot be solved by natural methods.
- We want to conduct business that is mutually beneficial to all parties involved.
- We want to know how our valued clients feel about our services and products and welcome all comments, suggestions and criticism.
- Our aim is to improve constantly and never become complacent.
- We are competent and professional but understand that life and business is a constant learning process.

Figure 6: Insecticidal Spectrum that BioKill® Functions

Biokill effectively eliminates the following insects:

- Cockroaches, like German and Oriental cockroach (all stages)
- Fleas and lice, including dog fleas, body lice and their eggs
- Ticks and mites, including brown dog tick, poultry lice, red bird mites, clover, cheese and dust mites
- Mosquitoes and gnats, including all Aedes and Culex species
- Flies, including house flies, stable flies, horn flies, face flies, cluster flies and Tsetse flies
- Moths & textile beetles, including carpet beetles, and Attagenus and Athrenus species
- Spiders and silver fishes
- Bugs, like pill bugs and bed bugs
- Termites, including dry wood and yellow foot termites
- Ants of all kinds
- Scorpions and millipedes
- Locusts and crickets, including plague and desert locusts, etc
- Out- and In- door beetles, like Japanese beetle, or rice weevil, flour beetle species, meal worms, drugstore beetles
- Aphids and many other plant pests, including green house white flies etc

Figure 7: Facts Sheets of Ecological and Environmental Behavior of BioKill®

The degradation of BioKill®'s active ingredient has been investigated in a wide variety of soil types. In all soil types, under aerobic conditions, degradation was fairly rapid from 5 –55 days with conversion to carbon dioxide as the major ultimate metabolic, this is very strong evidence for complete degradation. Due to its rapid absorption and degradation in the soil, the active ingredient has no effects on insects, nematodes, snails and worms living in soil. The active ingredient is completely non-toxic to earth worms; even 28 days after application of 100x above normal doses (5000 and 13500 g/ha) there was no change in number and species distribution of earth worm population.

In river and pond waters active ingredient, absorption to the sediments occurs very rapidly and only less than 2% of the compound remaining in the aqueous phase after 7 days. When mixed with sediment, the active ingredient will be absorbed within 1 minute. Hence this absorption process is a very important process for removal of active ingredient from natural waters. Degradation in mud sediments proceeds somewhat slower by ester cleavage as the major degradation step.

Figure 8: Comparison of BioKill®'s Products with Ordinary Products

<u>BioKill®</u>	<u>Ordinary Products</u>
<ul style="list-style-type: none"> • It only needs a clean and dry surface. • It needs thorough cleaning only as preparation. • It remains where it's supposed to and remains active. • BioKill® will protect the plants. • It is odorless. • BioKill® is absolutely safe for humans, plants and warm-blooded organisms. • It can be sprayed anywhere. 	<ul style="list-style-type: none"> • Sensitive areas have to be emptied and / or even covered. • Areas have to be cleaned twice, before and after the application. • They have to be cleaned away after the application. • Ordinary chemicals kill plants. • They leave a lingering disturbing smell. • Even "low toxic" chemicals could have adverse effects on health. • There are restrictions on areas for applications.

Figure 9: Pricing of BioKill®

BioKill Original

500 ml Bottle with Sprayhead

<u>ITEM</u>	<u>DESCRIPTION</u>
11916510	Bottle 500 ml Suggested Retail Price: HK\$ 49.80
11916520	Carton 12 Bottles

BioKill Original

200 ml Bottle with Sprayhead

<u>ITEM</u>	<u>DESCRIPTION</u>
11916210	Bottle 200 ml Suggested Retail Price: HK\$ 25.90
11916220	Carton 12 Bottles

BioKill Extra

200 ml Bottle with Sprayhead

<u>ITEM</u>	<u>DESCRIPTION</u>
11916210	Bottle 200 ml Suggested Retail Price: HK\$ 29.90
11916220	Carton 12 Bottles

Figure 10: Safety Reports Summary on BioCare

<u>Testing Perspectives</u>	<u>Testing on</u>	<u>Testing Result</u>
Oral	Rat	Not measurable
Skin	Rat	Not measurable
Inhalation	Rat	Not measurable
Initial skin irritation	Rabbit	Non-irritant
Initial eye irritation	Rabbit	Non-irritant
Showering	Dog	Non-toxic
Showering	Cock	Non-toxic
Swimming	Rat	Non-toxic

Figure 11: Pricing of Biocycle Pest Control Service (Monday- Saturday)

Short Term Contracts

No. of Apps.	1	3	4
Treatment area / Square feet	Short Term Contract (No Guarantee)	Short Term Contract (Cockroach)	Short Term Contract (Fleas)
	HKD	HKD	HKD
Under 1000	500	1,000	1,333
1001 - 1,500	650	1,500	2,000
1,501 - 2,000	800	2,000	2,600
2,001 - 2,500	950	2,400	3,200
2,501 - 3,000	1,100	2,800	3,700
3,001 - 3,500	1,250	3,200	4,000

Long Term Contract

No. of Apps.	5	6
Treatment area / Square feet	One Year Contract (Cockroach)	One Year Contract (Fleas)
	HKD	HKD
Under 1000	1,700	2,040
1001 - 1,500	2,400	2,880
1,501 - 2,000	3,000	3,600
2,001 - 2,500	3,500	4,200
2,501 - 3,000	4,000	4,800
3,001 - 3,500	4,600	5,520

NOTE: For short-term contract, three months warranty. For one-year contract, whole year warranty, no hassle, no disturbances - or we come back.

Figure 12: BioKill®'s Competitors

Table: Products of the competitors							
	Baygon	Raid	Speedtox	Fumakiller	Pif Paf	Combat	Ridsect
Cockroach							
Spray	✓	✓	✓	✓	✓	✓	✓
Bait Station	✓	✓		✓	✓	✓	✓
Mosquito							
Spray	✓	✓			✓		✓
Electric Mat vaporizer	✓	✓	✓	✓			
Electric Liquid vaporizer	✓	✓	✓	✓			
Ant							
Spray	✓	✓	✓	✓			
Powder	✓						
General							
Spray	✓		✓		✓		✓

Figure 13: Number of Household in Hong Kong

Table: No. of household in Hong Kong			
	<u>1994</u>	<u>1998</u>	<u>1999</u>
Number of households ('000)	1 762	2 042	2 108