

Effective Microorganisms - A Holistic Technology for Humankind

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Abstract

The world to day faces a multitude of problems, primarily that of pollution and poisoning. These cause pain to humankind, in terms of physical and mental discomfort. Analysis of reasons to these problems highlight one significant phenomenon. The world is neglecting an important part of our environment - that of microorganisms, primarily due to the fact that these important microbes are not visible to the naked eye.

The loss of microbial activity in our environment leads to many problems. Production of food, the removal of pollutants, development of a healthy environment are all determined by microbial activity.

Thus, the technology of Effective Microorganisms (EM) was developed to overcome these problems. The technology was initiated in the 1980's in Japan, and was based on developing sustainable organic food systems. The success achieved in this field - both in terms of crops and livestock, including aquaculture led to its expansion into industries and even health. The latter was based on the development of extracts from solutions of EM, which have abundant energy, developed through the activity of free radicals. The use of these extracts have now spread to humankind, who use it for maintaining health. Research identifies its use in overcoming nuclear pollution as well. Therefore, this technology can be seen as one which has a holistic role for the future well being of humankind, The presentation highlights the current developments of this technology.

Introduction

One of the biggest problems that humankind face today and has faced throughout history, has been the disposal of wastes. The accumulation of organic wastes develops odors, due to putrefaction - which is unbearable after sometime. However, in the early years, humankind used these wastes for a very important purpose. That was to use them as sources of nutrients for plants - which were fed to the people and provided fodder to animals. However, with the advent of time, populations grew, especially in the poorer countries, which caused pressure on land. The availability of wastes was limited and there was a high demand to produce more food from limited land.

This dilemma brought about the use of chemicals to supply the required plant nutrients - along with the new varieties that could not produce the potential yields without fertilizers and pesticides to protect them. This was called the green revolution. At that time, this revolution was the best thing that could have happened. Yields of rice and wheat increased dramatically and people all over the world praised those who were responsible - as they were saviors of humankind - as technologies required for feeding the masses, especially the poor peoples, where quantity mattered rather than quality of food or the environment.

Problems of Modern Agriculture

The happiness lasted for over three decades - and problems emerged. This is nature - We are all aware that a human being - at the time of birth is hailed as someone from heaven. With time, that person reaches the prime of activity - around 25 - 30 years when the pinnacle of life is reached - fast life, great ambitions, marriage and families. Thereafter, the progress is one of slow decline - ailments, financial crises, family problems mount up - but life has to go on. People seek the help of therapists, doctors and psychiatrists, not forgetting the bankers of course -to overcome their problems. With time, humans became machines and the holistic approach to life was lost, especially in the developed world.

This was also seen in agriculture and environment - where the excessive use of chemicals destroyed an important part of our environment that we could not see at all - therefore, it was forgotten - This

was the microbial life, which sustained the production process by decaying the wastes and providing nutrient rich environments for plant growth and removing organic debris to cleanse the surroundings of humankind. The excessive use of chemicals killed the microfauna and flora - causing problems of soil fertility, loss of crops, pest and disease problems and pollution of the environment. These are the problems that we face today.

Kyusei Nature Farming

However, all hope was not lost - as there were erudite philosophers, who had theories to overcome this problem. Most of these people looked at one aspect of the problem only - In contrast, there was a very simple but experienced and knowledgeable person named Mokichi Okada in Japan, who foresaw the problems that humankind would face in the future. He was not a soothsayer, but a simple person with a great vision. Therefore, he advocated the concepts of Kyusei Nature Farming - the term **Kyusei** meaning “**saving the world**”.

The method of agriculture advocated by Mokichi Okada has five basic principles - these are as follows:-

- The production of food having a high quality for the advancement of human health
- The development of economic and spiritual benefits to the producer and consumer
- The preservation of sustainability and ease of adoption
- The conformation to laws of nature and environmental protection
- The procurement of food for the increasing populations

Therefore, this method of life, which was holistic in its approach, was a sustainable and self contained method of agriculture, which did not depend on chemicals. However, it was capable of bringing economic stability and preserving the environment.

Effective Microorganisms

The technology of EM which was developed by me was initiated in the 1970's. the objective was to help the ailing agricultural sector to overcome problems of pollution and to help the organic farmers who were producing food and were beset with problems of low yields and quality. Therefore, I developed a mixture of microbes, using the very common species found in all environments and extensively used in the food industry - namely Lactic Acid Bacteria, Photosynthetic Bacteria and Yeasts. It never contained any genetically manipulated species and never will - and EM, which was developed by accident, was seen to be technology that could solve agricultural problems of the world. It is safe, low in cost, and results in high quality and sustainable results. People in some countries even drink it. It is safe.

The technology, developed by me in the 1970's was expanded through diligent research - and was ripened - like a very good wine - over time. It was blended with the concepts of Kyusei Nature Farming in the early 1980's as those advocating the principles of Mokichi Okada saw that his technology as a means to help them maintain the stability and advance the concepts of their system. The technology was offered to the world in 1989 through the International Conference on Kyusei Nature Farming held in Thailand. At this conference, the scientists from 13 countries formed a network, the **Asia Pacific Natural Agriculture Network (APNAN)** to test the scientific validity of this technology in their own environments, which were facing the problems of pollution in chemical agriculture and low productivity of organic systems. The technology was further strengthened by the many scientific conferences held from that time - the International Conferences held in Brazil, USA, France in 1991, 1993 and 1995, and again in Thailand last month. All these conferences highlighted the success of the technology in agriculture. Furthermore, the technology was adopted in the management of environmental problems of animal production systems and waste water. These developments gave further strength to this technology, which was originally developed for agriculture. The results were so successful that many countries adopted the technology as national policy - for example, Pakistan, Myanmar, Vietnam and Indonesia, and very recently the Peoples'

Democratic Republic of Korea - Prominent non government organizations are using this technology in countries such as Brazil, Nepal, Sri Lanka, Belgium, Holland and South Korea. It is being practiced and studied over 60 countries in all continents of this world - the technology is spreading - not because I say that it is good - but because they are realizing the benefits of the technology and its holistic nature to overcome problems of production and preservation of food and the environments. Therefore, it is not a toy, but reality as one cannot fool all the people all the time - especially scientists, administrators and policy makers of different countries. The technology has been presented at many international fora, especially that of the International Federation of Organic Agriculture Movements (IFOAM) which has supported the last two International Conferences on Kyusei Nature Farming.

At present, the technology is spreading very fast - and I am now at times unable to cope up with the demand for it. However, please be assured that we will try our best to help all those who need help - It may take a little time to get not the money but dedicated people to carry out this gigantic task.

Mode of Action of EM

I would now like to draw your attention to the mode of action of EM.

You are all aware that the process of decay of all objects is oxidation. I thought of this very seriously - to see if there was a connection between the mode of action of EM and oxidation. Therefore, research was undertaken and very recently, it was shown that the multitude of benefits of EM could be attributed to the presence of many antioxidant substances that are developed by EM. These substances develop the resonance waves required to produce an antioxidative environment which helps maintain productivity and sustainability.

You may wonder what antioxidative substances are found in EM. Research has shown these to be low molecular polysaccharides, bacteriocin and mineral complexes, which are developed primarily by photosynthetic bacteria and by the low wave resonance stemming from EM. Therefore, research has shown that photosynthetic bacteria possess natural characteristics of being electrogenic and can be used as biocatalysts. Based on this concept, photosynthetic bacteria are a fundamental ingredient in EM. The energy produced by EM can be and has been measured by NMR (Nuclear Magnetic Resonance) and LFA (Life Field Analysis). Therefore it is real and not some crazy thinking.

I do not want to burden you all with scientific jargon - Therefore, I would like now to move onto speak on some of the more recent advances in EM -to illustrate its holistic nature.

Recent Advances in EM Technology

Humans have become a burden to nature - The excessive consumerism of modern humankind is polluting this world - and its nature - and mother nature is hitting back - This causes the problems.

The benefits of EM can be used successfully and diligently to stop this disaster. EM is used in disposing wastes and making them good organic fertilizers at a very low cost in an effective manner to provide a good wholesome environment to humankind. EM can be used effectively for this purpose. Let us begin with our day to day lives - One of the most important places that generate reusable wastes is our kitchen. Normally these wastes are dumped, thereby becoming urban problems. Sewage and waste water are two others - that are problems. However, EM has been used successfully in both instances. In South Korea, the Red Cross of the Pusan city is using EM to make good compost with kitchen wastes - thus promoting organic farming in high rise apartments and surrounding gardens. Waste water and sewage of the Gushikawa city library is treated with EM and reused in irrigation and gardening. This is being done in Egypt and South Africa, and also in China. In Thailand, EM is used in the management of city garbage - at a site just outside Bangkok in Ladkra Bhan - where 3000 - 4000 metric tons of garbage are dumped daily and EM sprayed - three to four times. There are no flies, and there is no smell.

In agriculture, one of the biggest pollutants are animal husbandry units -especially swine and poultry. EM is used to overcome the smell and the management of wastes - which is the biggest problem faced by animal producers. We have developed integrated systems where the waste is used

in cropping in a very short time, in a successful manner. This is indeed remarkable and the examples are numerous - in all parts of the world. including Europe. Research at one of the most prestigious universities of Europe, at Wageningen clearly highlight this concept. Therefore, you see that EM is indeed a holistic technology for agriculture of this world - to produce high quantities of good quality food in a simple sustainable and safe manner.

Let us now move onto the industries which generate many pollutants -both in a solid and liquid form. The use of EM in such instances have proven to be very beneficial. There are examples in China and Vietnam where EM has been very successfully used in cleaning waste water. A corn starch factory in Nanjing, China has overcome problems of waste water by using EM. The sludge is used as a fertilizer by farmers. Waste water with oil is treated with EM in Brazil and the USA - and the results are very clear - that the BOD is reduced making the water clean and safe. EM is also used in the Tivoli Gardens of Copenhagen to clean their lake -all these show the benefits of EM.

In terms of solid wastes, EM has the capacity to decompose organic matter such as rubber and in some instances, given the time, biodegradable plastics. Therefore, in waste management EM has a significant role to play, for the betterment of humankind.

The world today is alarmed by global warming. It affects our future and also the future of some countries such as the Maldives Island and Bangladesh which may get inundated with the rise in sea levels.

What causes global warning? One of the biggest problems is the methane gas generated by rice fields and also by the use of fossil fuel. Research in Malaysia and China has shown that the application of EM reduced the emission of methane from rice fields. In the same context, the use of EM in factories, where the fumes are passed through ceramics made with EM have a lower content of these gases. Do these examples not show the holistic nature of EM ?

Another area where EM is used is in land development. Desertification is a major problem in all parts of the world. In the developing countries with very high populations this will cause grave dangers. I am happy to inform you that EM is used in overcoming desertification as well. A project initiated by us in collaboration with the China Agricultural University in Beijing has shown that application of EM enhances the process of revegetation of the deserts of inner Mongolia. A United Nations project in Tibet is also pursuing this program and we are in the process of negotiating our help to them.

How does EM achieve these miracles ? I assure you that EM is not a miracle - it is not magic. The microbes use these wastes as their feed - this the law of ecology where the wastes of human activity are used by the microbes for feed and conversion into useful substances - this is nature and if we live with this fact, it will be very easy to understand the action of EM.

Let us now move onto the most recent developments in EM, which again highlight its holistic nature.

One of the most disastrous events that took place in recent times is that of the nuclear accidents at Chernobyl, in Belarussia. This disaster caused much harm to humans, animals and the environment. Research undertaken by the Academy of Radiobiology at Minsk in Belarussia have shown that EM helps plants take up greater quantities of nuclear material, thereby reducing pollution. These plants have to destroyed but the soil is made safe for future agriculture. Is this not a benefit of EM ?

Another example is the use of EM In disease control, especially In aquaculture. The shrimp industry in Thailand is one that earns much needed foreign exchange. EM is used widely in this industry to contain diseases. Here again one sees the benefit of EM.

The holistic nature of EM is strengthened by the fact that a derivative of EM - termed EM_X was developed by me a few years ago. This solution, marketed in many countries, including Japan is used as a health drink. If one cultures it, you would not see colonies of microbes - as it does not contain any. The EM_X has extracts - the antioxidative substances of EM are extracted and made into a stable liquid solution - This organic product is safe and develops the immunity system of humans - it helps relieve pain and tiredness - all these have been proven - and on a more optimistic note, EM_X has also been tested on AIDS patients in Thailand with very promising results. Recent studies on the

use of EM_x in the motor car industry have shown that this solution increases fuel efficiency and reduces emission of polluting gases. While the tests are promising some are already using EM_x in their cars with good results. This too will lead to the reduction of pollution.

EM also acts as a source of energy. The waving resonance theory that I briefly described as the mode of action of EM is one of energy and this energy, which some call as entropy is the principal method of action. The process of oxidation and reduction is also one of electron transfer which is again energy. This is the important link - although neither seen nor heard. I also emphasized on aspects that one could see, hear, smell and feel - the benefits of EM - as we cannot touch, feel or smell energy - we only feel it in our inner beings.

Current Status of KNF

There are two avenues by which EM is made available to peoples of the world. These are through the advocates of Kyusei Nature Farming - the **International Nature Farming Research Center (INFRC)** of Atami, Japan, which produces it under my guidance and make it available at virtually cost free to peoples of the developing world especially for agriculture, and the **EM Research Organization (EMRO)** of Okinawa, which principally markets EM_x on a moderate profit. However, all the profits of the sale of EM go into the development of EM technology especially in the developing world. The funds thus generated do not go to one individual, but they go into national projects in the developing countries. For example, we help projects in Myanmar, Bhutan, Laos, Vietnam, Sri Lanka, India and Bangladesh which are among a few. Funds are used for training people here in Thailand, where there is a magnificent farm using EM. We also provide support to countries such as New Zealand, Belgium and France in terms of the technology. The principal feature is that funds generated from developing countries are used. For further development within that country. The funds that are generated in the developed world are used for expansion of activities in the region and also in new regions. This is the case in Africa.

Conclusion

Energy is something that we cannot live without. How do we get energy ? The easiest experience is that of light, which is vital for life. EM encompasses both these aspects as EM is also alive - and uses living beings. Treat it as you would treat another living being and I assure you that given the conditions for the development and maintenance of populations of these Effective Microorganisms, they will function to make this world a better place. This is the holistic approach of EM - one of action within the global framework of human activity. It will make this world a better and a sustainable place for all of us and for our future generations.