Bt EGGPLANT: A REVIEW OF SCIENCE COMMUNICATION APPROACH IN THE PHILIPPINES

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ABSTRACT

This paper provides for a review of science communication in relation to the controversies surrounding Bt eggplant commercialization in the Philippines. It looks at the communication messages used by proponents of the biotech crop and the anti-biotechnology groups. It is organized around how these two opposing bodies crafted their messages for public consumption.

Moreover, this paper looked into the deficiencies of science communication in promoting products of advanced science technology such as the Bt eggplant to the public. A point of contention is how the scientific community regards its public in its communication efforts and it further suggested how the public should be viewed by the scientific community. It also explored the merging of multi-disciplinary fields and science communication to address the need of the public to know. This paper puts importance on why science communicators should be able to breakdown science and translate it for the public.

Keywords
Science Communication, Advanced Science Technology, Bt eggplant, Fruit and Shoot Borers (FSB), Marketing, Public, and Consumers

I. INTRODUCTION

Advanced science technology has never been more precise than ever, having more controlled analytical methods and equipment. Nevertheless, the public continues to be more skeptical and wary of any product of advanced science such as biotechnology crops. Biotechnology crops are genetically engineered agricultural crops developed as public products for the benefit of the people. One of the public biotechnology products in the Philippines is the
**bacillus thuringiensis** (Bt) eggplant that is highly resistant to the fruit and shoot borer (FSB), which is an insect pest that feeds on the leaves and shoots of eggplants during the early vegetative stage and feasts on the fruit during the fruiting stage.

Developed by the University of the Philippines Los Baños – Institute of Plant Breeding, Bt eggplant underwent multi-location field trials in various part of the country to ensure its safety: Sta. Maria, Pangasinan; Bay, Laguna; Sta. Barbara, Iloilo; Baybay, Leyte; Davao City and Kabacan, North Cotabato. These field trials were done to fully evaluate its safety and performance and are strictly monitored by the Department of Agriculture (DA), Bureau of Plant Industry (BPI), the National Committee on Biosafety of the Philippines (NCBP) and the Department of Science and Technology (DOST) Biosafety Committee. These regulatory government agencies ensures that biotech crops are safe for commercialization, and an independent body of assessors called the Scientific and Technical Review Panel (STRP), also ensures the biosafety of the product. According to Dr. Sergio R. Francisco, Chief Science Research Specialist and Program Leader, Impact and Policy Research at the Philippine Rice Research Institute (PhilRice), the Philippine biosafety scheme is considered as a model by many countries (SEARCA-BIC).

The effective mechanism of the Bt insect-resistant technology has proven to increase production of eggplant and reduce pesticide impact to the environment. Most importantly, Bt eggplant has the potential to contribute to food availability. As it is, eggplant is the leading vegetable crop in the Philippines in terms of land area at 21,170 hectares, and volume of production at 200,942 metric tons (Bureau of Agricultural Statics, 2011) which makes it a potential major food source for the growing population of the country. Eggplant is the highest consumed vegetable in the country because of its affordability and the Bt variety of eggplant will even increase the production by 10% (SEARCA-BIC, 2012). Eggplant production suffers yield losses from pests, diseases and extreme environmental conditions. The most destructive insect pest of eggplant in the Philippines and other Asian countries is the Fruit and Shoot Borer (FSB). Eggplant yield losses from 51 to 73% due to FSB have been reported in the country (SEARCA-BIC, 2012).

In September 29, 2010, the Bureau of Plant Industry of the Department of Agriculture approved the application for multi-location field trials of Bt eggplant in the country. University of the Philippines Los Banos - Institute of Plant Breeding, spearheaded the project. However, the implementation of the multi-location field trials encountered fierce resistance from various anti-GMO groups due to health and environmental issues. As a result, some field trials, including that of the University of the Philippines Mindanao in Davao City, were stopped while approval to conduct field trials in some areas of the country was put on hold. The issues raised by these NGOs and environmental groups on the effects of biotech crops on people’s health as well as the environment could have been addressed by the scientific community’s understanding of what it needs to communicate and to whom.

II. SCIENCE, COMMUNICATION, AND ITS PUBLIC

The need of the scientific community to communicate its efforts saw the emergence of science communication, a relatively new area of communication study that focuses on communicating scientific and other technical knowledge/information to the public. It is basically all about communicating science, scientific technology and scientific advancements in a
manner that the general public can understand and appreciate science (Mullahy, 2004). However, there are complexities both in science and communication. Science communicators should be able to breakdown science and translate it for the public. A definition that is more reflective of what science communication is that of which “the scientific culture and its knowledge become incorporated into the common culture” (Bryant, 2004). Common culture, in this sense, is made up of everyday people – the public – and the everyday life.

When a product of advanced science technology is presented, it is important for the public to know its direct relevance and benefits to their lives. Providing the public with the right and comprehensible information will enable them to make the right judgment and decision on what is acceptable science in the future. However, science communication is not only about public acceptance but, first and foremost, about public awareness. Science technology is highly dependent on a receptive and appreciative society (Sinemus and Egelhofer, 2007). New applications derived from science and public diffusion of scientific knowledge contributes to the well-being and economic development of countries (De Semir, 2010). As such, the popularization of such products is necessary to encourage its use and also to make the public aware of its benefits.

Thus, the aim of science communication should go beyond traditional forms of communication wherein it is not just to inform but rather to identify, connect, and engage with its public.

III. Bt EGGPLANT: FEARS, UNCERTAINTIES, AND DOUBTS

Science communication efforts towards public awareness on Bt eggplant in the Philippines were initiated to influence participation of various stakeholders – farmers, academe, government regulators, media, and the scientific community itself. However, non-government organizations (NGOs) and environmental groups are now participating in a public debate about the acceptability of biotech crops in the country. These groups and the proponents of Bt eggplant, each with separate agendas, aim to reduce public trust in the other and gain public trust for themselves. This situation often leaves the public more confused and distrustful of everyone involved.

It is inarguable that Bt eggplant is a potential food source. However, a petition filed for writ of kalikasan and writ of continuing mandamus by non-government organizations (NGOs) and environmental groups against the field testing of bacillus thuringiensis (Bt) eggplant in the country set back almost 10 years of development of “potentially the best environmentally friendly technology for eggplant production” and “hindering this experiment is similar to snatching a safe, potential medicine to food insecurity.” (SEARCA-BIC, 2012).

During the 10th anniversary of the Biotechnology Coalition of the Philippines (BCP), Prof. Peter Davies, a Jefferson Science Fellow of the US Department of Agriculture (USDA), stated that the world will be hungrier in 38 years if biotech crops are not allowed for propagation since the global population would expand to nine billion by then. However, current information on Bt eggplant often highlight its advanced technological achievements and breakthroughs and not on its direct benefits to the public. In various articles on Bt eggplant, science communication promotes biotechnology as “the next gold mine”, “a silver bullet,” “most promising option,” “salvation of the poor”, “quick fix for a global problem,” “manna from heaven,” “an achievement that could throw
open the gates to a new green revolution of super crops”, “the millennium’s menu against a million enemies”, and “solution to food production problems” (M.J. Navarro, J.A. Panopio, D.B. Malayang, N. Amano, Jr, 2011). But what do these really mean to the public?

At the forefront of biotechnology information in the Philippines is the SEARCA Biotechnology Information Center (SEARCA-BIC) of the International Service for the Acquisition of Agri-biotech Applications Global Knowledge Center (ISAAA KC) and the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA). It was officially established in 2000 to address the needs of the region for a highly credible, sound and factual biotechnology information center in the Southeast Asian region. Most, if not all, of their information resources are focused on the promotion of biotechnology itself. SEARCA’s information resources are composed of biotechnology publications, articles, brochures, magazines and information resource kits containing informational background on biotech crops, fruit and shoot borer (FSB) in eggplant production, bacillus thuringiensis (Bt) eggplant technology and its applications, and crop and agricultural biotechnology as the solution to food security and sustainable agriculture (SEARCA-BIC, 2012).

Even in a SEARCA Biotechnology Information Resource titled, FSBR/Bt eggplant: A safer, more profitable biotech innovation, communication messages to promote Bt eggplant consists only of information on the technological innovation that will address the problem and effects of fruit and shoot borer (FSB) in eggplant production – “Eggplants are battered by pests, diseases and extreme environmental conditions. The most damaging pest is the fruit and shoot borer (FSB; scientific name, Leucinodes orbonalis Guenee). FSB could ruin up to 100 percent of output” (Francisco, 2010). Furthermore, the same article emphasized the unhealthy and expensive use of pesticides by farmers which can be minimized or reduced through the use of FSB-resistant variety of eggplant, by introducing the gene found in soil called bacillus thuringiensis (Bt) (S. Francisco, J. Maupin, G. Norton, 2009).

Dr. Randy A. Hautea, Director of International Service for Acquisition of Agri-Biotech Applications (ISAAA) also stated that “propagating such crops could even help mitigate changes in the climate.” Biotech crops use less mechanized equipment for farming thereby reducing the use of fuel and reducing carbon emission as well. Also, biotech crops minimize land plowing, thus preventing carbon trapped in the soil from escaping to the atmosphere. Furthermore, farmers who grow such crops will also need less herbicide and insecticide which otherwise harm humans and the environment which come into contact with these chemicals (R. Hautea, 2011). Pesticides and insecticides are toxic chemicals designed to be deliberately released into the environment (PAN-UK). A large amount of pesticides can easily contaminate air, water, sediments, and can end up in the food we consume.

While eggplant is the No. 1 vegetable in the country in terms of production, 95% of the eggplant production is discarded due to insect pests. A 2009 study by Dr. Francisco, et al. entitled “Value of Environmental Benefits of Bt eggplant in the Philippines” indicate that to minimize the effects of FSB, eggplant farmers spray the crop with pesticides as much as 80 times per season and in extreme cases, unharvested eggplant fruits are dipped into a mixture of several chemicals to ensure higher yield and income.

Given these examples of how Bt eggplant is communicated to the public, it is evident that
what is essential to the scientific community’s point of view is its scientific and technical breakthrough. Instead of simplifying the information, their statements highlight the technicalities it brings to the Bt eggplant which further create uncertainties among the public. On the question of health and environmental risks, information purely on the technology of Bt eggplant and other biotech crops will not be sufficient to allay fears of its consumption and ill effects to the country’s ecology.

On the other hand, campaigns against Bt eggplant and its multi-location field testing organized by Greenpeace Southeast Asia, MASIPAG or the Magasasaka at Siyentipiko para sa Pag-unlad ng Agrikultura, and Sibol ng Agham at Teknolohiya are centered on the ill effects of its commercial cultivation. Dr. Chito Medina, national coordinator of MASIPAG, stated in an interview that “If the multilocation trials of the genetically modified eggplants persist, they will pose serious threats not only to farmers, but also to consumers’ health and the environment as well,” (Philippine Daily Inquirer, June 2012). In another news article, Mr. Daniel Ocampo of Greenpeace Southeast Asia said that “The Bt eggplant experiment poses a threat to the environment and to farmers’ livelihoods...Once these experimental GMOs (genetically modified organisms) flower, their pollen can contaminate both conventional and organic crops, irreversibly damaging them.” (MindaNews, March 2011).

The Philippine Network of Food Security Programmes (PNFS), an organization advocating sustainable agriculture and community-appropriate technologies, also stated that Bt eggplant did not undergo adequate tests “to determine the safety of friendly insects, possibility of inducing pest-resistance and emergence of new pests, and the issue on health hazards” (Davao Today, September 2012). Bantay Konsumo, a multi-sectoral organization that assists consumers to avail of the right price for the right quality of goods they buy, also argued that “allowing them to mass produce Bt eggplant is tantamount to risking public health...studies proved that genetically-modified crops have adverse effects both on human health and environment.” (Davao Today, September 2012).

In the ongoing debate, it is apparent that both proponents and critics of Bt eggplant are using the effects of Bt eggplant on health and environment as their main point of argument. However, unlike the scientific community, the anti-biotechnology groups focused directly on the basic concerns of the public – Bt eggplants’ potential risks to their health and environment. In comparison, the scientific community’s central point of communication is on the farmer’s higher yield and profitability. The important role of the public as consumers is diluted in the process.

IV. IMPLICATIONS

The debate on Bt eggplant in the Philippines or what is referred to as the Talong (eggplant) War is a testament to the importance of the public in science communication. As such, a point of contention in science communication is how it views its public in promoting a product of advanced science technology.

The anti-biotechnology groups use health and environmental risks of biotechnology and its dire consequences, even in the absence of scientific data. The proponents of Bt eggplant, for their part, highlights the potential of this biotech crop to contribute to food availability as well as to mitigate climate change and global warming. What must be noted at this point is that any product of technology will always have its risks but its benefits may far outweigh these risks when it comes to the important issue of food availability.
Although the proponents of Bt eggplant has the scientific data to support its development of an FSB-resistant eggplant, their tendency to focus on methods, details and accuracies of the technology prevents them from being able to share their work in a non-technical form. Their propensity for such puts further distance between science and its supposed beneficiaries. It is this deficiency of the scientific community that enables the anti-biotechnology groups to influence public perception.

The perceived risks of biotechnology and its products mostly highlighted by anti-biotechnology groups instilled fear, uncertainties, and doubts among the public. Instilling fear, uncertainties, and doubts (FUD) is a strategy often used to influence public opinion. FUD is a tactic used in sales, marketing, public relations, politics, and propaganda (Harris, Rhonda. 1998). The NGOs and environmental groups use this strategy to influence public perception by spreading negative or inaccurate information about Bt eggplant. In a public debate, public perception and opinion matters. By nature, people prefer familiar to the unfamiliar. It is our innate aversion to ambiguity (Shefrin H., 2002).

Science communication for most people is full of ambiguities. As mentioned earlier, the technical jargon usually associated with science and technology create more questions than answers. This does not mean, however, that science cannot be communicated to the public. To communicate science, science communicators must be able to relate science to everyday life.

Science and technology communicators can learn from the discipline of health communication where researchers are often successfully conveyed because of its focus on its direct relevance to everyday people. Health communication merges multi-disciplinary fields such as marketing, advertising, epidemiology and psychology (Mullahy 2004).

In the case of science communication, communication efforts can be drawn from a marketing perspective wherein the individual roles of the consumers, the product, and its benefits are the important factors for communication. The application of psychology is necessary as well to determine consumer attitudes and behaviors towards the development and acceptability of a new product. And lastly, advertising is also an integral part in the communication process because of its capacity to reach out to a large number of people.

Furthermore, a merging of multi-disciplinary fields can provide for answers to important questions when communicating science to the public:

- Why communicate science in the first place?
- What science should be communicated?
- To whom should it be addressed?, and
- Whose interests are served? (Russell N., 2010)

In direct relation to science communication, marketing, psychology, and advertising can provide for the reasons why consumers need to know about a public product like Bt eggplant, what characteristics or features of this product are relevant and beneficial for the consumers, and who are these consumers.

As a rule, consumers are more accepting of advanced technology when they are informed of its direct and tangible benefits. In the case of Bt eggplant, consumers can change their degree of willingness to consume this biotech crop when benefits such as reduced pesticides, improved
nutritional qualities and lower purchase price are presented to them.

V. BIBLIOGRAPHY


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