Matthew Blevins - Re: consideration of alternative technology

From: <Hawaiiexport@aol.com>
To: <MXB6@nrc.gov>
Date: 02/28/2007 9:38 PM
Subject: Re: consideration of alternative technology

Dear Mr. Blevin,

please find attached my answer to your question. I also included alternative sites as siting and technology are inseparable given the special geographic circumstances in Hawaii.

Please let me know if you have any questions.

Sincerely,

Michael Kohn
Pa`ina Hawaii LLC

In a message dated 2/14/2007 11:08:09 A.M. Hawaiian Standard Time, MXB6@nrc.gov writes:

> Mr. Kohn,
>
> As part of the development of the final EA it would be helpful if you could elaborate on any consideration you gave to alternative technologies (e.g., electron beam or heat treatment). Thanks for any input you can provide.
>
> Matthew Blevins
> Senior Project Manager
> Division of Waste Management and
> Environmental Protection
> U.S. Nuclear Regulatory Commission
> Phone: (301) 415-7684

Mail Envelope Properties (45E63CAF.8C8 : 3 : 2248)

Subject:	Re: consideration of alternative technology
Creation Date	02/28/2007 9:37:58 PM
From:	<Hawaiiexport@aol.com>
Created By:	Hawaiiexport@aol.com

Recipients
nrc.gov
OWGWPO01.HQGWDO01
MXB6 (Matthew Blevins)

Post Office	**Route**
OWGWPO01.HQGWDO01	nrc.gov

Files	**Size**	**Date & Time**
MESSAGE	967	02/28/2007 9:37:58 PM
TEXT.htm	2249	
022807 alternative technologies and sites.pdf	28296	
Mime.822	43839	

Options

Expiration Date:	None
Priority:	Standard
ReplyRequested:	No
Return Notification:	None
Concealed Subject:	No
Security:	Standard

Junk Mail Handling Evaluation Results
Message is eligible for Junk Mail handling
This message was not classified as Junk Mail

Junk Mail settings when this message was delivered
Junk Mail handling disabled by User
Junk Mail handling disabled by Administrator
Junk List is not enabled
Junk Mail using personal address books is not enabled
Block List is not enabled

Dear Mr. Blevin,

To best answer your question I'd like to explain to you what impact alternatives such as e-beam (x-ray) and heat treatment mean to us and many other small shippers in Hawaii. As you will see this letter will also look at alternative sites.

Pa`ina Hawaii seeks to help develop agriculture on all islands by opening the US market. Many farmers and small shippers sell produce to the local market and Vancouver, Canada, which does not require any treatment. Some 3 million people live in both markets combined. This compares to a population of 300 million people in the US. The US of course requires treatment. Existing E-beam and heat treatment facilities are not viable alternatives because they are 1) outright monopolized, 2) geographically not accessible, 3) limited in product quality control, 4) limited in application, 5) decrease produce quality, 6) use fossil fuels (converted to electricity) or are 7) unreliable technologies.

We (Hawaii Fruit Company) are a small company that packs and ships papayas and other tropical fruits. Our company has been exporting papayas since 1988. Our main markets have been the EU countries that don't require treatment. In order to justify the high cost of production in Hawaii and the high cost of flying papayas half around the world, we specialize in shipping tree-ripened, high quality fruits. We first tried to package fruit on the Big Island, then ship them to Honolulu and then on to Europe. We quickly stopped packing on the Big Island because we lost control over the quality in Honolulu. The biggest problem was to maintain a low temperature to stop the tree-ripened fruits from turning overripe. To this day we have a packing house at Honolulu airport for that reason. Four nights a week we fly in papayas from the Big Island, process and chill them and ship them to Germany. It is an elaborate undertaking, but is the only way to ensure high quality, tree-ripened fruits. To maintain a high standard of quality, fruits transshipped through Honolulu International Airport must undergo final preparation at the airport.

Since the early 90's we have been looking at building a treatment facility so that we can export to the US mainland. Back then, heat treatment was the only available technology. We quickly realized the drawbacks of heat treatment. Heat treatment requires a chamber holding many tons of fruit at a time. Treating less than a full chamber is not economical. Treating more than one type of produce at a time is generally not allowed (e.g. papaya and lychee).

Papayas must reach a core temperature of 47 C. Mixing large fruits with small fruits will overheat smaller fruits. Since tree-ripened fruits (50 to 100% bright yellow) can not withstand temperatures of 47 C, farmers now must pick a ripeness range from grass green to perhaps 50% yellow. A 50 to 100% ripe fruit is considered tree-ripe, and commands a premium price. Fruits ranging from solid green to 50% yellow will mature at different times; with less bright shell color and less sugar content and consequently command a lower price. (Irradiation can treat any sized fruit of any maturity, mixed or not; without having an adverse effect on the quality of the fruit.)

Some heat treated fruits turn ripe within 24 hours. Some take days, requiring resorting by color. Often disease or bruising is not apparent when the fruit is green and hard. Again, resorting for bruised and diseased fruits is required as the fruit matures (maybe not at the packing house but certainly somewhere down the distribution line, which adds even further costs). Treatment, sorting and packing must take place in a fruit fly-free environment; usually a large building accommodating the many steps needed to pack the desired quality fruit in its final shipping container. In other words, enough warehouse space needs to be paid for to treat, pack, re-sort and store fruits.

Since heat treatment and subsequent sorting and packing are contracted out to the heat treatment facility, it is very difficult for shippers to maintain direct control over the quality of fruit packed out. This is because heat treatment must be done prior to packaging, while irradiation is done after packaging. The degree of ripeness is very important. Mainland markets often complain about fruit that is too green.

Because partial culling occurs after heat treatment, facilities are located close to production areas to avoid unnecessary transportation cost of discarded fruits. Shipping unsorted fruits over long distances to a heat treatment facility would incur additional transportation costs for culled fruits. The increased cost would be especially high if a heat treatment facility were to be located at Honolulu airport.

Heat treatment is approved for only a small number of fruits and vegetables that are grown in Hawaii. The primary purpose of this treatment for papaya is to kill the larvae of the four species of fruit flies present in Hawaii. Recently it has been determined that the Malaysian fruit fly can survive a temperature of 47 C. As of Feb 23, 2007 the USDA amended its list of approved products for heat treatment and removed tomato, squash, pepper and eggplant due to the Malaysian fruit fly. Should a Malaysian fruit fly be discovered in a commercial shipment of papayas, irradiation will be the only treatment left to ship to the US mainland.

While heat treatment has been successfully used it is limited to only a small array of approved fruits, it needs large batches to treat, it needs to be close to production areas, it reduces fruit quality and at a location like Honolulu airport would require high lease costs for a large building.

In contrast, irradiation can treat virtually all produce to be exported and can treat virtually all infested produce or other infested products (e.g. wood products) when imported. That is true for x-ray as well as cobalt-60 technology. Either technology can also irradiate fruit fly pupae for USDA for their preventive release program on the mainland.

The most valuable function an irradiator can perform is treatment after final packaging, while in transit and without applying heat. Irradiation can be done anywhere in Hawaii before it is sent off to the mainland. If the purpose of the irradiator is to service the agriculture community on all islands, it is logical to build one close to the State's most important distribution center, which is Honolulu airport and Honolulu harbor. Transportation cost and delays to the farmers and shippers are held to a minimum as shipments must pass through Honolulu. Placing it on an outer island would only benefit that particular island. Placing the irradiator on Oahu, but away from the airport has no benefit. Given Oahu's traffic situation, it would greatly delay transportation to the facility, resulting in missing scheduled outbound flights. It takes only about 10 minutes to travel from one end of the airport to the other. Driving 10 miles to and from the airport could take one hour or more, and increase truck traffic on roads that are already suffering from congestion. The cost of a refrigerated truck would be necessary, adding as much as 37% to the treatment cost of papayas. In this day and age it would be irresponsible to burn additional fossil fuels for useless and unnecessary transportation.

There are however, some significant differences between x-ray technology and cobalt-60. The following comparison is limited to the only x-ray food irradiator in the US, which is located on the Big Island of Hawaii.

Electron beam works very well and efficiently for product that is thin and uniform. Papayas and other fruit are not. Product that is thicker than 3 inches can not be treated by an electron beam. Electron beam needs to be converted to x-ray in order to have enough penetration to treat entire produce boxes. During the conversion 93% of the energy is lost. The cost of electricity here in Hawaii is very high. The per pound cost for electricity alone is estimated at over 4 cents, a significant factor.

X-ray technology is not new. It is very sophisticated and requires constant upkeep by highly qualified personnel. Frequent breakdowns have occurred, some lasting two weeks before the x-ray machine was functional again. Those breakdowns have lead to tremendous losses for shippers. They were forced to "dump" their product on the local market or destroy it. This has an adverse economic effect on the entire Hawaiian agricultural system. During peak seasons like Christmas, mainland customers were left without product, and scrambling to obtain product from

competing sources like Latin America. This has left the impression that Hawaii is not a reliable source for agricultural products.

An x-ray facility would cost some 6.5 million dollars to build near Honolulu airport. Since the power of the e-beam generator determines output, it has a fixed production capacity. Capacity can not be gradually increased to match growing demand for Hawaii products.

The economic future of x-ray technology was put on hold when Sure Beam, the vendor, went bankrupt, leaving investors with losses in excess of $100 million. Even the Big Island X-ray facility had to reorganize under new ownership. It would make little sense for Paina Hawaii to invest in a failed company and a technology that does not suit Hawaii's needs.

Category III irradiators have been around for over 50 years. They have a proven safety record, they have not impacted the environment and they are very reliable. Safety has been our foremost concern. No accident has ever occurred in a category III irradiator. The International Atomic Energy Agency in Vienna calls this type of equipment "inherently safe". The safety for both workers and the public is designed into the equipment. The cobalt remains passive and securely shielded. A hoist system is the only moving part to place product in front of the source. No downtime is expected other than routine maintenance, and the rare occasion of reloading cobalt-60.

Unlike x-ray technology, capacity can be increased to match rising demand by installing additional cobalt. At a total cost of less than $3 million, the proposed cobalt-60 facility costs less than half of an x-ray facility, while maximum annual capacity is more than double.

X-ray requires a large amount of electrical energy. The on-demand electricity is mostly generated by fossil fuel burning generators, such as coal and oil. Hawaii imports most of those needed fossil fuels from Indonesia, a country that is not regarded as a reliable trading partner or noted for being politically stable. The Genesis irradiator using Cobalt-60 requires comparatively little electric power, and has no negative impact on our environment. Cobalt-60 will come from qualified suppliers located in either Canada or England. Both countries have proven to be reliable partners of the US.

Cold and methyl bromide treatment (fumigation) or just visual inspection (non-host status) are approved for a very few products. These alternatives are of little help to diversify Hawaii agriculture. The table below depicts the various approved products for export to the mainland from Hawaii. The table was adjusted to reflect the very recent, Feb 23, 2007 decision by USDA to take off tomato, Italian squash, pepper and eggplant from the approved list for commodity quarantine treatment.

Summary: Commodity quarantine treatments for Hawaii's fruits and vegetables

Abiu	I	Longan	I, H
Atemoya	I	Lychee	I, H
Avocado	C	Mango	I
Banana	I, N	Papaya	I, H
Bell pepper	I	Pineapple	I, N, H
Carambola	I, C	Rambutan	I
Citrus	H	Sapodilla	I
Durian	N	Sweet potato	I, F
Eggplant	I	Tomatoes	I
Italian squash	I		

I = irradiation, C = cold, N = non-host status, H = heat (hot water immersion or vapor heat), F = fumigation

compiled by:
Dr. Peter Follett, Research Entomologist, Postharvest Tropical Commodities Research Unit
Tel. (808) 959-4303, Fax (808) 959-5470, e-mail pfollett@pbarc.ars.usda.gov

The percentage distribution of approved treatments for all 19 approved products is as follows:

Irradiation	84%
Heat	26%
Cold	10%
Fumigation	5%
Non-host status	5%

Based on the above facts it is clear that there is no alternative technology or location that will meet the goal of providing shippers on all islands the opportunity to ship treated agriculture products to the mainland. The cobalt-60 irradiator could also play a very important role in dis-infestation of imported products, aimed at preventing the introduction of additional invasive species. Again alternative locations to Honolulu airport or alternative technologies to a cobalt-60 make no sense.

Honolulu airport, and at close proximity Honolulu harbor, are the most important terminals for imported food products to the State. Locating treatment or destruction facilities away from the airport or harbor will only add cost, and provide an opportunity for the alien species to escape before treatment or destruction. This is particularly true for locations on the outer islands.

Hawaii is the capital of invasive species, which are a serious threat to its people, ecology and agriculture. Recent examples are the nettle caterpillar, causing severe welts by using very sharp spindles. Another very recent example is the little red fire ant. While most ants bite, the little red ant has a stinger like a bee. The red fire ant is expected to eventually enter into the coffee growing areas, making it difficult for workers to harvest the beans. The organic growers will have very little options to control the ant. The list goes on and on.

Some 2500 alien species have been introduced to Hawaii. 98% of those are considered pests. Many of those invasive species are also the very reason why Hawaii agriculture products can not be freely exported. Instead pests like fruit flies require Hawaii shippers to treat its products. The Hawaii Department of Agriculture (HDOA) is significantly increasing its inspection program for imported products to protect Hawaii's environment. The Hawaii Legislature has approved funding to double the inspectors to tighten down on the introduction of further alien species. The purpose is to intercept alien species and find the most economical and sensible solution to deal with the potential pest.

Shipping back to sender is a possibility but very expensive. Destruction of the product and the hitchhiking alien specie will mean total loss of the product, and additional destruction costs will be required. At the discretion of the HDOA, treatment to salvage the product is possible. Depending on the type of treatment, some underlying data will be needed to justify a specific commodity treatment. In the past methyl bromide had been used for its effectiveness to kill pests and specific data is often available. But fumigation companies are reluctant to provide this service any longer due to liability issues. Methyl bromide is being phased out, under the international Montreal Protocol because it is known to deplete the earth's ozone layer. Methyl bromide also diminishes the quality of specific fruits. Cold and hot treatments could be used, but data is often not available for specific commodities using cold or heat treatment. Generally speaking, small batches of infested product are often costly to treat as the entire chamber needs to be used.

Irradiation is not commodity specific, it is rather pest specific. The recently approved generic dose by the USDA (APHIS) of 400 gray would be sufficient to treat any alien species other than pupae or adult moths. Irradiation can be used cost effectively on small batches and has virtually no impact on the product quality.

Again irradiation technology is more suitable than any other alternative treatment. For the same reasons mentioned above it would make no sense to choose X-ray technology over proven cobalt-60 technology.

If Pa'ina Hawaii were limited to x-ray technology, and/or had to place the facility 10 miles away from the submitted location, I would not be able to justify an investment in this private business venture. It is unclear how using x-ray technology or using a different location would have a different impact on the environment, but only on the economics of the process. One might conclude that the criticisms of the "Finding of No Significant Impact" by the NRC are merely an effort to make the entire project not economically feasible. The alternative of not building the Pa'ina irradiator, as submitted, would have a significant negative impact on the future of Hawaii agriculture, integrity of Hawaii's fragile ecosystem and unique quality of life.

Sincerely,

Michael Kohn
Pa`ina Hawaii