

**TESTIMONY**

**SB 709 SD 1**



**DEPARTMENT OF BUSINESS,  
ECONOMIC DEVELOPMENT & TOURISM**

LINDA LINGLE  
GOVERNOR  
THEODORE E. LIU  
DIRECTOR  
MARK K. ANDERSON  
DEPUTY DIRECTOR

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Statement of  
**THEODORE E. LIU**  
**Director**

Department of Business, Economic Development, and Tourism  
before the

**SENATE COMMITTEE ON WATER, LAND, AND HAWAIIAN AFFAIRS**

Friday, February 27, 2009

2:45 p.m.

State Capitol Auditorium  
Room 229

in consideration of  
**SB 709 SD1**  
**RELATING TO AGRICULTURE.**

Chair Hee, Vice Chair Tokuda and Members of the Committee.

The Department of Business, Economic Development, and Tourism (DBEDT) understands the intent of SB 709 SD1, which would provide that no genetically modified taro shall be developed, tested, propagated, released, imported, planted, or grown in the State of Hawaii. Although we have respect for the cultural importance of taro to native Hawaiians, and appreciate the inclusion of Section 3 which states that this bill shall not serve as a referendum on the merits of biotechnology nor be applicable to any other crop, we have serious concerns that other groups may use this to set a precedent for a ban on all genetically modified plants and therefore, do not support this bill.

The life sciences industry in Hawaii plays an important role in diversifying the economy. We are concerned that a ban on this type of research would send an anti-science message to the community, at a time when we need to promote the importance of science to our children in Hawaii schools. Work is being pursued on many fronts to increase the availability of Science, Technology, Engineering and Math (STEM) education, both locally and nationally to better prepare our future workforce to meet the challenges of today's economy. By banning research, we would send the wrong message to our children, whom we are trying to interest in future careers in science.

In addition, Hawaii's science and technology business leaders rely on a positive business and community attitude toward science in order to qualify for research grants and attract investment. The growth of Hawaii's science and technology businesses provides opportunities to create higher paying jobs to bring back our children to Hawaii after college education on the mainland. This bill would send an anti-business message, particularly within the science and technology sector.

Furthermore, it is our understanding that a de facto moratorium regarding research on Hawaiian varieties of taro already exists with the University of Hawaii, College of Tropical Agriculture & Human Resources (CTAHR). We believe that CTAHR has previously agreed not to pursue genetic engineering research on native Hawaiian varieties of taro without prior consultation with the community. This approach to solving the problem, without excluding a valuable tool should the need arise, would seem to be more productive and inclusive.

Thank you for the opportunity to provide these comments.

**pass SB709 as is**

Ashley Osler [aosler@earthlink.net]

**Sent:** Tuesday, February 24, 2009 9:52 PM

**To:** WTLTestimony

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## Testimony for SB709 on 2/27/2009 2:45:00 PM

mailinglist@capitol.hawaii.gov [mailinglist@capitol.hawaii.gov]

**Sent:** Tuesday, February 24, 2009 9:59 PM

**To:** WTLTestimony

**Cc:** andrea@malamakauai.org

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Testimony for WTL 2/27/2009 2:45:00 PM SB709

Conference room: 229

Testifier position: support

Testifier will be present: No

Submitted by: Andrea Brower and Keone Kealoha

Organization: Malama Kaua`i

Address: 4900 Kuawa Road Kilauea, HI.

Phone: 808-828-0685

E-mail: andrea@malamakauai.org

Submitted on: 2/24/2009

**Comments:**

Malama Kaua`i is a non-profit working on behalf of the `aina, culture, and community of Kaua`i, educating, advocating, and implementing solutions towards a sustainable future. Our organization strongly supports a ban on the genetic modification of ALL varieties of taro. There are major environmental and economic threats associated with the questionable, highly untested technology of plant genetic modification. In addition, taro is a highly sacred plant, a deep cultural value that has catalyzed massive public opposition to proposed genetic manipulation. Please respect the people and culture that have preserved and perpetuated the invaluable genetic diversity and wealth of taro today.

Caren Diamond  
P. O. Box 536  
Hanalei, Hi. 96714  
February 16, 2009

**Testimony in Strong Support SB709 ,**

WTL

Room: 229  
Hearing Date 2/27/2009  
2:45:00 PM

Aloha Committee Members,

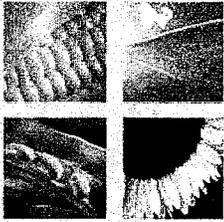
Please support **SB709** . Biodiversity is the key to plant life and Hawaii's agriculture , necessary for our sustainability and food security into the future . A ban on genetically engineered taro in Hawai'i will provide a protection not just for the Hawaiian varieties, but for all taro cultivars found in the state.

Allowing taro to be genetically modified will risk the integrity of the plant as a local food crop, the environment, fragile taro markets, and consumer health. It is also inappropriate due to the high significance of taro in Hawaiian culture.

The genetic manipulation of taro is undesirable and unnecessary. There are many traditional means of building good soil health and improving crop quality that should be utilized, rather than the use of genetic manipulation of such an important staple to the people of Hawaii.

Please support this important bill.

Mahalo for your support, Caren Diamond



# Hawaii Crop Improvement Association

*Growing the Future of Worldwide Agriculture in Hawaii*

Testimony By: Alicia Maluafiti  
SB 709sd1, Relating to Agriculture  
Senate WTL Committee  
Friday, Feb.27, 2009  
Room 229, 2:45 pm

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**Executive Director**

Alicia Maluafiti

Position: Strong Opposition

Chair Hee, and Members of the Senate WTL Committee:

My name is Alicia Maluafiti, Executive Director of the Hawaii Crop Improvement Association. The Hawaii Crop Improvement Association (HCIA) is a nonprofit trade association representing the agricultural seed industry in Hawaii. Now the state's largest agricultural commodity, the seed industry contributes to the economic health and diversity of the islands by providing high quality jobs in rural communities, keeping important agricultural lands in agricultural use, and serving as responsible stewards of Hawaii's natural resources.

As stated in previous years, HCIA member companies do not grow taro nor do we have an interest in taro as a commercial research and development crop. We consistently affirm and respect the cultural meaning of Hawaiian taro and firmly believe that the Hawaiian community must lead the discussion of the future of Hawaiian taro, and Hawaiian taro research and education programs.

HCIA does not support legislating a moratorium on taro or any other agricultural crop grown in Hawaii. Such policies send a chilling message that Hawaii is not in support of science and technology. It undermines future investments and growth potential for responsible use of agricultural biotechnology as a 21<sup>st</sup> Century tool for farmers.

We stand firmly on the thousands of science-based and peer reviewed studies and 3,400 scientists around the world that attest to the safety of agricultural biotechnology. (The Safety of Agricultural Biotechnology study listing is available upon request) Plant research using this technology is not only safe but has the advantage of being more efficient. It requires significantly less time to produce new cultivars and is more precise than traditional plant breeding. As a result, varieties can be developed which are more productive and better adapted to local needs. It is an option or tool for plant breeding when other methods fail.

Thank you for the opportunity to present testimony.

**TESTIMONY ON SB 709 SD1  
SENATE COMMITTEE  
ON  
WATER, LAND, AGRICULTURE, AND HAWAIIAN AFFAIRS**

**CHAIRPERSON:** SENATOR Clayton Hee  
**BILL NO:** SB 709 SD1 Abolish GE Taro Research  
**TITLE:** Eliminating GE Taro Research  
**HEARING DATE & TIME:** Friday, February 27, 2009 2:45 PM  
**HEARING LOCATION:** Conference Room 229

**TO: Chairperson Senator Clayton Hee and Members of the Committee:**

My name is Don Gerbig, a retiree from the sugar industry, and an advocate of sound science and the use of biotechnology (genetic engineering) where applicable, to improve crops and fight hunger in the world.

I am opposed to this bill due to its lack of scientific merit and the threat it may have on future research that may benefit the commercial taro growing industry in Hawaii.

As stated in the bill preamble there were over 300 taro varieties in the past and we are now down to around 80 varieties, and not all of these can be used for commercial production. This 70% variety loss over the years should send up all kinds of warning signs that maybe the 30% remaining may not last either. I am only advocating genetic engineering as being just one of the options to possibly save the industry, not the whole answer.

This bill, to ban GE taro research has no scientific merit. When over 25 million acres of GE crops are being grown in the world, and acreage is increasing every year, it is difficult to believe that all these threats of harm being talked about are real. Especially, when NO scientific studies are presented to support their conclusions.

Banning a certain taro research method, such as genetic engineering, is like saying that we must eliminate black paint because we think it might be harmful, but we don't know why it is harmful, yet we can still use all the other colors. Do we assume, and on what basis, that black cannot be the answer to the problem?

As most in the Ag industry in Hawaii know, there are few if any registered crop protection chemicals for taro. In other words there is little in the way of protecting taro from insects, animal pests, and plant diseases like other crops.

Taro plant breeding, is a research method that may save a threatened taro industry from future unknown pest problems. Genetic engineering should not be completely eliminated, with this bill, from being a possible part of the solution in controlling taro pest problems.

The University is hard at work on finding a solution to work with growers where GE taro research might be acceptable. Passage of this bill will eliminate a much needed solution and understanding of this research, and sends a message to the world that Hawaii is not a place for plant research. Please do not pass this bill out of Committee.

Don Gerbig  
Lahaina, HI 96761-8322

***Puakala Farms***  
*Producers of Quality Fruits and Vegetables*  
**P.O. Box 261, Kualapuu, Molokai, HI 96757**

February 25, 2009

**Hawaii State Legislature**  
**State Senate Committee on Water, Land, Agriculture and Hawaiian Affairs**

***Testimony in SUPPORT of Senate Bill 709, SD1***  
***Prohibiting the development, testing, propagation, release, importation,***  
***planting, or growing of genetically modified taro in the State of Hawaii.***

Aloha! My name is Glenn Ioane Teves and I'm a Hoolehua Molokai homestead farmer, and I have grown taro and banana for over 20 years now. I have been a County Extension Agent with the University of Hawaii College of Tropical Agriculture on Molokai for 27 years. I also serve as Vice-Chair on the Taro Purity and Protection Task Force mandated by the 2008 State Legislature. However, I represent myself in this testimony.

One of the best justifications I hear for developing genetically-modified taro is to protect it from killing viruses Alomae and Bobone found only in Melanesia. How real the threat has never been adequately assessed. A lesser debate centers on developing taro cultivars resistant to corm rots and leaf blight. However, if you talk to most wetland taro farmers, their biggest threat is apple snails.

There are also killing disease on other crops, specifically coconut where a mycoplasma has killed most coconut trees in Florida. It would be a real disaster if this disease got to Hawaii, since coconut trees are such an important backdrop for the tourist industry. Yet no one is talking about genetically modifying coconuts!

If the main reason for developing these GMO strains of taro is to prevent the accidental introduction of these killing diseases into Hawaii, then we should be fortifying our borders and ports of entry as our first line of defense to prevent the introduction of these diseases, but this hasn't been done. The military continues to land at will with minimal scrutiny and inspection. They open the front of these giant C-130 transport planes and insects fly out freely, home at last. We still have at least 10 new major pests that enter our Oahu ports of entry each year.

In most crop production problems, you need assess the situation and understand all aspects of production. More importantly, you need to separate the symptoms from the problem. This is basic to medicine and the curing of sicknesses. Maybe the plant is weak due to nutrition or limited water flow. This has not been done for taro, and attempts are being made to do this through the Taro Purity and Protection Task Force. If GMO testing on taro is allowed to move forward, it would circumvent this grower led initiative that is expected to not only prioritize challenges, but identify possible solutions! I believe that farmers know best, and they should be allowed to take the lead in solving their own problems instead of imposing solutions and strategies on them.

Only in the last 10 years has UH CTAHR put energies into taro. This is not to lay blame on them since much of the research funding is focused on crops of economic importance to the nation, such as corn, soybeans, and others. Taro is not on the radar screen, and this is one of the main problems faced by both UH and the taro growers. But there's funding to further the knowledge of genetically modifying organisms. We cannot chase funding because it's there; it needs to be relevant to our problems and are solutions acceptable to the farmers.

However, I don't believe CTAHR or any research institution has exhausted all avenues in conventional taro breeding to solve the problems we presently face in Hawaii. As my colleague, fellow extension agent Alton Arakaki, has stated to me many times, the only real change in taro technology in Hawaii was a shift from a wooden o'o to a metal o'o. The UH CTAHR process for identifying critical research and extension needs starts with the agricultural community identifying key production problems. This has not occurred with taro.

As a dry land taro farmer, I want to get a better handle on weed control and optimal nutrition so I can produce high quality poi and kulolo for Molokai. I want site specific solutions for my farm in Hoolehua, Molokai. I believe some the new hybrids offer solutions to my challenge to grow high quality dryland taro to convert into poi. I don't think my needs are unique, but you'll never know unless you ask taro growers.

Commercial taro breeding has only been conducted in Hawaii over the last 10-15 years. I congratulate research pioneers, such as Dr. Eduardo Trujillo, in developing leaf blight-tolerant cultivars through conventional breeding, such as Palehua, Pauakea, and Pa'akala. They are among the highest yielding taro today and have potential for commercial kulolo production or as a mix with Lehua taro for poi. Dr. John Cho has been conducting a taro breeding program on Maui for over 10 years now, and has brought conventional taro breeding to the next level, but has recently retired. Who will continue this work? UH-CTAHR is just starting to address conventional approaches to solving taro production problems and should continue this work instead of jumping ship and moving into GMO quick fix that may bear no fruit, but will consume a lot of money. Multi-disciplinary research is the wave of the future.

In closing, I believe it's too early to move to the next level of research when we really haven't made an honest attempt in understanding the base problems, and developing sustainable and holistic approaches to problem solving. As we move away from the 'chemical fix' generation into the generation of sustainability, I hope we can be pono in what we do. After growing taro for over 25 years, all I can say today is, "I think I know something about taro" since there's so much to learn about this plant and its culture. I believe there are many opportunities to increase high-quality taro production in Hawaii, and some may be very simple if we put our heads together. Mahalo for this opportunity to respond to this bill.

**\*\*SPECIAL NOTE:** I have attached a picture of some of the taro I grow. This one is called Pa'akala and is a hybrid between Maui Lehua and a Palauan variety called Ngeruuch.



**Dr. Harold Keyser**  
**Personal Testimony on Senate Bill 709 SD1**  
**Relating to Restrictions of Genetically Engineered Taro**  
**February 25, 2009**

**Position: OPPOSE**

My name is Harold Keyser, and I am the Maui County Administrator with the University of Hawaii at Manoa's College of Tropical Agriculture and Human Resources (CTAHR). This personal testimony does not represent the official position of the University of Hawai'i or CTAHR.

The stated purpose of Senate Bill 709 is to protect the cultural integrity and genetic biodiversity of taro; yet, the bill proposes to prohibit discovery, to prohibit intellectual advancement, and to prohibit the development of knowledge products related to taro. Such prohibition on scientific progress could equate to the beginning of the end to taro in Hawaii, and puts taro at more risk than it already is.

There is absolutely no evidence to determine that harm has been done by a form of modern plant breeding (genetic engineering) to justify the prohibitions of Bill 709. The numerous benefits and examples of disease resistance and increased vigor to crops from use of modern methods of plant breeding should be considered against the theoretical and even contrived risks claimed by opponents with no evidence.

The threats to taro of *Alomae-Bobone* viral complex are real and potentially devastating (just one threat we know is out there in the Pacific region). To not be able to utilize the versatile and powerful modern methods of plant breeding if they are needed defies logic and common sense, and should be unacceptable to every citizen, including policy makers, of the state.

The Pope put Galileo under house arrest for the heresy of confirming Copernicus's claim that the earth was not the center of the universe; the Flat Earth Society has been trying to deprogram the masses since 1547; and the Luddites of England destroyed advanced looms to stop the evils of the industrial revolution. These historical follies against science, against discovery, against intellectual advancement, and against development of knowledge products are now written about with amusement. Surely, the Hawaii Legislature does not intend to march backwards, away from progress, to join such ill-considered and prominent examples of anti-science milestones.

I urge you to support a more reasonable approach; a temporary restriction on planting genetically modified taro is one thing, but banning research is unreasonable, unjustified, and unwise. It is probable that it is just a matter of time before a significant biological threat to taro arrives here; religion, culture, and political correctness will do no good at that point, whereas science may be able to lend a hand (if it's not in handcuffs). Be careful of what you wish.

Thank you for this opportunity to express my opinions.

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**From:** Eden Peart [hawaiifarmersunion@gmail.com]  
**Sent:** Wednesday, February 25, 2009 6:45 PM  
**To:** WTLTestimony  
**Subject:** Hawaii Farmers Union Testimony SB 709

Hawaii Farmers Union

[www.hawaiifarmersunion.org](http://www.hawaiifarmersunion.org)

Eden M. Peart

P.O. Box 1863

Honokaa, HI. 96727

**TESTIMONY ON SB 709**

Moratorium on the growth of genetically modified taro

Senate Committee on Water, Land, Agriculture and Hawaiian Affairs

Friday, February 27, 2009 2:45 pm

Senate conference Room 229

Senator Clayton Hee – Chair

Senator Jill N. Tokuda – Vice-Chair

Committee Members:

Senator Robert Bunda

Senator Carol Fukunaga

Senator Russell S. Kokubun

Senator Dwight Y. Takamine

Senator Fred Hemmings

Aloha Senators,

Hawaii Farmers Union fully supports SB 709 in its current form covering all varieties of taro, including Chinese Bun Long. The current bill reflects the recommendations of the Hawaiian caucus and represents the wishes of the vast majority of Hawai'i taro farmers who have expressed their support for such a moratorium.

Hawaii Farmers Union is the newest subdivision of the National Farmers Union. Established in 1902, NFU is the oldest general farming organization in the United States, representing nearly 300,000 family farmers, ranchers and fishers.

Farmer/producer grassroots-developed policy is the hallmark of Farmers Union. The NFU policy on Genetically Modified Organisms and Biotechnology articulates the position of family farmers in relation to GMO crops. *This policy is a result of farmer/producers actual experience with genetically modified crops.* For that reason, if NFU policy had been considered before the release and commercialization of GMO varieties of papaya, the resultant widespread contamination of identity-preserved (non-GMO,) papaya and the subsequent plummeting of market value and loss of markets could have been avoided.

In recent testimony, opponents of SB 709 have misrepresented NFU policy by suggesting that GMO research is promoted. Careful reading of the policy (provided below) dispels that assertion. In fact, during the 2008 NFU annual meeting and adoption of policy, the biotech/GMO portion was actually clarified to include language that calls for prohibition of any research conducted in open field tests, such as the thousands of unregulated field tests that have taken place in Hawai'i. 2008 policy changes further called for public disclosure of all aspects of any research. This conservative policy is in harmony with the late Congressmember Patsy Mink's statement about the growing of GMO corn in Hawai'i, "I am not satisfied that such experimentation can be done safely in a place like Hawai'i with so many endangered species."

The overall intent of NFU policy is to advocate for family farmers and calls for decisions affecting them, including research, to be based on farmers' self-identified and prioritized needs. In that light, HFU urges lawmakers to address the concerns and challenges groups like Hui Kalo have articulated including access to land and water, and by all means honor their request to cease and desist from GMO related activity related to taro due to its cultural and practical inappropriateness.

Sincerely,

Eden Marie Peart

Hawaii Farmers Union

## **2008 Policy of the National Farmers Union**

[www.nfu.org](http://www.nfu.org)

### **12. Genetically Modified Organisms and Biotechnology**

Genetically modified organisms (GMOs) have created a series of ethical, environmental, food safety, legal, market and structural issues that impact everyone in the food chain. Consumer and producer concerns need to be addressed.

We acknowledge concerns that biotechnology is being used as a trade barrier. We respect all nations sovereignty and food policies and thus urge open dialogue, cooperation

and understanding in trade negotiations relating to biotechnology. We support:

- a) A moratorium on the patenting and licensing of new transgenic animals and plants developed through genetic engineering until the broader legal, ethical and economic questions are resolved. The moratorium should include the introduction, certification and commercialization of genetically engineered crops, including all classes of wheat, until issues of cross-pollination, liability, commodity and seed stock segregation and market acceptance are adequately addressed. Research conducted in an environmentally secure facility should be exempt from this moratorium. Research conducted in open field production should be subject to mandatory public disclosure of; persons or entities initiating the research, location of test sites, and specific species and traits involved and the characteristics of the intended resultant genetically modified plant to be created. Should commercialization of a new GMO become imminent, we encourage the appropriate regulatory authority to provide for a public input and review process, including production of economic and environmental impact analysis prior to commercialization;
- b) Legislation to exempt farmers from paying royalties on patented farm animals and technical fees on seeds which have been genetically modified;
- c) Legislation to prohibit the patenting of heritage seed, animal and biological genetics;
- d) Legislation to prohibit the further use of tax dollars in developing terminator technology, e.g., a gene to ensure that seed will not reproduce;
- e) Legislation to prohibit the development and selling of seed that is sterile;

- f) The right of farmers to plant seed derived from proprietary organisms on their own land;
- g) New products involving GMOs be certified as safe by the FDA in testing done independently of the patent holder, at the specific patent holder's expense before being allowed on the market. Such testing is to be done at the expense of the specific patent holders seeking to market such products;
- h) Legislation requiring that patent holders or owners of GMO technology be held strictly liable for damages caused by genetic trespass including safety, health, economic and environmental effects. Farmers are not to be held liable for food safety, human health or environmental problems, including cross pollination, related to the use of GMOs as long as generally accepted crop production practices are followed;
- i) Congressional action to regulate the biotech industry's technology agreements. Farmers should not have to sign away their fundamental rights, including, but not limited to, a jury of their peers in court in exchange for the privilege of growing biotech crops. Grievances should be settled in the home state of the farmer, not the state of the biotech corporation;
- j) Any damages caused to farmers through lower prices, lost markets or contamination shall be fully reimbursed to farmers, including legal fees, by the company producing the genetically modified product;
- k) All data used in the analysis of the health and environmental effects of GMOs be public record, and that criminal penalties be established for the willful withholding or altering of such data;
- l) Prohibiting government regulatory agencies from licensing genetically modified products that are not acceptable for both human consumption and animal feed;
- m) Until USDA and FDA improves oversight and regulation of pharma crops, NFU cannot endorse or support pharma farming based on economic, environmental, food

safety and liability risks to producers and consumers;

n) Requiring government regulatory agencies and input suppliers to ensure that farmers are informed of all potential market risks and segregation requirements associated with planting any licensed genetically modified crop;

o) Government regulatory agencies shall consider domestic and foreign consumer acceptance of the product when licensing;

p) Requiring all GMO seed to be clearly labeled with the following information: 1) markets (foreign or domestic) where the product is not accepted; and 2) all planting restrictions;

q) Development of a paper verification system and a storage and marketing plan to aid farmers with non-GMO grains;

r) Identity-preserved systems and insist they receive protection from cross contamination; and

s) Requiring genetically altered or engineered food products to be appropriately labeled to inform consumers. Food products derived from cloned animals should be labeled at the retail level.

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Join Hawai'i Farmers Union today !  
<http://hawaiifarmersunion.org>

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**From:** nancy redfeather [nancyredfeather@hawaii.rr.com]  
**Sent:** Wednesday, February 25, 2009 9:47 PM  
**To:** WTLTestimony  
**Subject:** Testimony: Strong Support for SB 709,SD1

>>  
>> Aloha Chair and  
>> Members of the committee,  
>>  
>>>>  
>>>> Before you today is a request to support the  
>> Hawaiian food  
>>>> crop and sacred ancestor Taro. I am not a  
>> taro farmer, but  
>>>> farm taro for my family and friends. I  
>> have had the  
>>>> privilege and pleasure of working with Jerry  
>> Konanui these  
>>>> past few years on many taro projects at the Amy  
>> Greenwell  
>>>> Ethnobotanical Garden in Kona. He has been  
>> working as you  
>>>> know, to preserve the 85+ known varieties for the  
>> future, to  
>>>> catalog them, and help people to understand the  
>> importance  
>>>> and significance of this food crop for our food  
>> future. I  
>>>> have learned from him, and through my own  
>> experience what is  
>>>> needed at this time to grow taro in a healthy  
>> way.  
>>>>  
>>>> All agricultural crops today are in danger of  
>> being changed  
>>>> at the genetic level. For those doing the  
>> work, they may  
>>>> truly believe they are helping to create plants "resistant" to  
>>>> disease. But, unless they  
>> farm or  
>>>> garden themselves, they may not understand that  
>> the true  
>>>> health of the taro or any other crop, depends upon  
>> the  
>>>> health of the water and the soil in which it is  
>> grown. When  
>>>> the farmer grows only one variety of taro,  
>> when  
>>>> chemical fertilizers, pesticides, and  
>> herbicides are used  
>>>> to grow the plant, when the waters of the lo'i are  
>> cut  
>>>> off, or too warm, when invasive species such as

>> the apple  
>>>> snail ravage the lo'i, disease will occur.  
>>>>  
>>>> When disease occurs, moving to change the system,  
>> to  
>>>> increase the health of the field or lo'i, is what  
>> is  
>>>> needed. The taro farmers know that already,  
>> and they are  
>>>> currently experimenting with ways to bring back  
>> the health  
>>>> to their fields. Genetic engineered  
>> varieties are not  
>>>> needed. They are time consuming to create,  
>> and extremely  
>>>> expensive.  
>>>>  
>>>> Once a GE crop is created and planted in the  
>> field, it will  
>>>> be impossible to distinguish it from other taro  
>> plants.  
>>>> Very few people know the taro like Jerry  
>> Konanui. He can  
>>>> tell every variety by the way it looks, it's  
>> color, etc.  
>>>> Once the Bunlong variety is genetically  
>> engineered by UH  
>>>> Manoa, and it spreads over the island malas, the  
>> genetic  
>>>> purity of the Hawaiian Kalo will change.  
>>>> The patented genetic material will be owned  
>> by UH. This  
>>>> is not something anyone who farms taro would  
>> want.  
>>>>  
>>>> The University and HDOA say, that disease will  
>> eventually  
>>>> come in from Polynesia and ravage the Hawaiian  
>> taro and then  
>>>> there will be none left, they "have" to engineer resistance into  
>>>> the taro. But, HDOA no  
>> longer inspects  
>>>> shipments of taro coming from around the world,  
>> potentially  
>>>> bringing unique diseases to Hawai'i. They  
>> say they are  
>>>> "preempted" by a USDA federal law which prevents inspection. Then  
>>>> they should apply for an "exemption" to the preemption. They could  
>> be  
>>>> helping control disease and invasive species at  
>> the borders.  
>>>> Their call for GE varieties are "the  
>> solution"  
>>>> doesn't make sense. If they took the  
>> millions of  
>>>> dollars and created positions and policy around  
>> inspection,

>>>> they could potentially save many diseases and  
>> pests from  
>>>> entering this unique and pristine environment.  
>>>>  
>>>> While we wait for that day, farmers'  
>>>> groups across the state can and are taking  
>> the health and  
>>>> future of this crop to heart, and are creating  
>> workshops and  
>>>> experimenting with new/old ecologically  
>> sustainable methods  
>>>> of production that will restore the health to the  
>> taro. We  
>>>> will need all these varieties for Hawai'i's Food Future. I ask  
>>>> that you vote in the  
>> affirmative and support  
>>>> this Bill.  
>>>>  
>>>> Malama Haloa,  
>>>>  
>>>> Nancy Redfeather  
>>>> Farmer  
>>>> Kawanui, Hawai'i  
>>>>  
>>>>  
>>>>  
>>>>  
>>>>  
>>  
>>

Testimony transmitted by email 26 Feb 2009 from:

Penny Levin  
224 Ainahou Place  
Wailuku, Maui 96793

**TO:** Committee on Water, Land, Agriculture and Hawaiian Affairs  
Rm 229, February 27<sup>th</sup>, 2:45pm

**RE:** *Testimony for SB709 Relating to Agriculture*

Aloha Honorable Committee members;

Regarding SB709 *Relating to Agriculture*, I support the proposed legislation to protect taro in the State of Hawaii from genetic engineering.

Taro farmers have been coming out of the lo'i and traveling to the legislature for three years to lay this threat to their crop, their food, their livelihood and their culture to rest. Last year, over 7,000 people testified in support of similar legislation including taro farmers, Hawaiians, three County Councils, consumers, organic farmers, scientists, health practitioners and specialists, and other supporters from across the state. In November 2008, the County of Hawai'i passed an ordinance banning the genetic engineering of taro.

As a taro farmer with a background in science and biodiversity conservation, I have weighed the benefits and risks of genetically engineered taro carefully and found it to be too great a risk to the integrity of the plant as a traditional food crop, the environment, taro biodiversity, fragile taro markets, and consumer health. It is also inappropriate in the context of the significance of taro in Hawaiian culture.

For every proposed benefit, there are serious questions that remain in the highest standards of the science regarding the safety of transgenic crops for human consumption and the natural environment, as well as its true productivity and economic impact. The National Academy of Science, the highest regarded scientific organization in the US, along with the International Assessment of Agricultural Science and Technology for Development [IAASTD] project, the UN/Food and Agriculture Organization (FAO) and World Health Organization (WHO) support this conclusion. In 2008, IAASTD produced a rigorous 2,500 page report after a four year study involving more than 400 scientists worldwide which concluded that organic agriculture, greater biodiversity within smaller contiguous fields, and improving access to markets would have a far greater impact than GE crops towards shifting world hunger and reducing crop disease. The study was supported by more than 30 governments and 30 global funders, including the US, England, other European nations, the World Bank, UN/FAO, WHO and the biotech industry, who recently pulled out of the project because they did not agree with the recommendations of the report.

The State of California, recognizing the uncontrollable persistence and irreversibility of gmo plants that hybridize non-gmo crops or escape into adjacent fields (whether they hybridize or not), passed into law this year landmark legislation (AB541) protecting farmers from

crippling lawsuits by the biotech industry over cross-contamination. The companies do not compensate farmers for contaminating their fields even when organic certification is destroyed; rather, they consider cross-pollination or escape into other farmers' fields which can occur by wind, birds or insects to be theft of property rights. This says a great deal about who these companies really are and where their concerns lay.

But more important for taro in Hawai'i are three clear facts;

First, there are many problems that face taro that cannot be resolved by genetically modifying the plant. I have spent the last six years documenting the impacts and researching solutions with taro farmers to control the invasive apple snail, which is responsible for the highest percentage of crop and huli loss annually (Levin 2006; Hawaii Agricultural Statistics Service, multiple years). The apple snail is a major vector for other diseases that attack the taro; its razor sharp mouth creates a wound through which fungi and parasites can enter the corm, setting the stage for many forms of root rot. We know from experience and observation that solving the apple snail problem; improving soil organics, fallow durations and cultivar diversity; and restoring water to lo'i kalo will significantly reduce pests and disease occurrence and increase crop productivity. Removing the apple snails alone will eliminate an 18-25% crop loss and increase the available time a farmer has to care for his farm and his family by 50%. Proposed yield increases and disease resistance for GMO taro are hypothetical and untested; the apple snail will eat it anyway. There is no need or demand to grow GMO taro from local taro farmers or consumers. Indeed, even those few farmers who support continued gmo taro research, will not plant it in their fields. Better and safer options exist.

The genetically engineered taro has been developed using a variety called Bunlong, also known as Chinese, along with portions of wheat, rice and grapevine DNA. This variety has been used by taro farmers for more than 150 years in Hawaii – as a *leaf* crop and dryland table taro. It was *never* a poi taro and lacks the qualities of a good poi taro. It is used today mostly for the chip industry where tissue culture for clean planting material, good site selection, mulching and spacing practices significantly reduce disease. Poi millers use primarily Lehua and Moi. A genetically engineered Bunlong taro does *nothing* to improve disease resistance or production for poi taro farmers. Millers will not buy it and consumers will not eat it (UH CTAHR survey 2008).

Second, taro will survive without genetic engineering long into the future if we attend to the sources of the problem. Taro is one of the oldest human-managed food crops in the world; its use dates back more than 50,000 years by some accounts, but it's regular cultivation can be documented to 7,000 -10,000 years ago in South and Southeast Asia. For an estimated 1,200 years, taro in Hawai'i has survived volcanic fallout, floods, droughts, pests and disease. The presence of the word, *kakane* (a leaf blight on plants) in the Hawaiian language illustrates that taro leaf blight has been around a very long time. Agricultural records show that several taro disease events occurred from the mid-1800s to the mid-1900s; but, this was *not* the primary reason for the decline of taro in Hawai'i as some would suggest. Only since the apple snail reached critical destructive mass (1990s), has the confluence of lack of cold

water and poor soil quality created a corresponding persistence in disease occurrence in taro. A close look at data presented by HASS (2001) and UH CTAHR Cooperative Extension Services (Feb 2007) actually supports this understanding.

By the 1900s, many Hawaiians had lost access to both land and water. Many others died from disease, taking with them the knowledge of best growing practices and the taro varieties. In the 1930s, Chinese and Japanese farmers dominated commercial cultivation of taro, changing planting, mulching and fallow practices and cycles. Part of the decline in taro production can be attributed to changes in the market and in society. The demand for poi during the war declined significantly. A new era after WWII saw farming families urging their children to become doctors, lawyers and teachers rather than farmers; by the 1950s many people, including Hawaiians, preferred rice to poi. At the same time, farmers shifted away from organic mulching methods to chemical fertilizer applications initiating a long, slow decline in soil quality that persists today. The number of natural disasters during that same period severely impacted the productivity of taro-growing lands. Of the 50 tsunamis reported in Hawaii since the 1800s, seven inflicted major damage. The tsunamis of 1868, 1946, 1960 and 1975 and the hurricanes of 1940, 1957, 1959, 1982, 1986 and 1992 wiped out significant portions of low-lying taro lands, including those of Waipio and Pololu, Hawai'i; Halawa, Molokai; Keanae and Wailuanui, Maui; and Hanalei, Kauai (USGS and SOEST records). Major flooding events also took their toll, including in 1956, 1970, 1974-75, 1978-79, 1980-1983, 1987-88, 1991-92, 1999-2000, 2004 and the rains of Feb-March, 2006 that devastated Kauai growers fields (USGS; greater than 10,000ft<sup>3</sup>/sec). It takes an average two years to recover from such events; sometimes longer.

Archival records dating back to the early 1800s indicate it was attention to the soil and the water that kept the taro robust. Queen Emma herself grew taro whose corms averaged 22in. long and 22in. around and documented the careful management of the soil and plants by which she achieved this standard; something very few taro farmers still practice. She writes; *"the size of the roots depend upon the depth of loose soil, and the care bestowed on its cultivation. I have produced kalo which averaged twenty-two inches in length and the same in circumference when it was cultivated under my own eye, but far less in the same locality when the cultivation was somewhat neglected by my konohiki"* (HEN Vol. Arch. Collection, pp 76-83; undated manuscript, Bishop Museum; Queen Emma collection 71, nd, pg8).

Third, protecting the biodiversity of taro is critical to future survival, food and economic security. Hawai'i retains many of the ancient Hawaiian taro varieties, some of which are extremely rare, along with extensive ex-situ collections of taro from throughout the Pacific, and Asia. A ban on genetically engineered taro in Hawai'i provides a buffer of protection not just from cross-pollination but more importantly from simply the inability to visually distinguish between a gmo taro and a non-gmo taro in the field. The ban would protect not just the Hawaiian varieties, but all taro cultivars found in the state, an important resource for continuing to build leaf blight resistance using conventional hand-pollination techniques - or restoring traditional varieties back to their original islands throughout the region.

What we are asking for is a return to ethics in agriculture in Hawai'i - one where the researchers, institutions, agencies and industries who *say* they wish to help farmers are actually engaged in what farmers really need and ask for, rather than the pursuit of patents; where researchers also understand and take responsibility for the risks and burdens they place on us and our markets when they follow a path of their own making.

The State of Hawai'i made a commitment to taro by designating it as the State Plant and by establishing the Taro Security and Purity Task Force to address non-gmo issues for farmers in 2008. I urge the members of the Committee on Water, Land, Ocean Resources, and Hawaiian Affairs to further this commitment by passing in full support SB709 without changes.

Mahalo nui loa.  
Respectfully,

Penny Levin  
Taro Farmer and conservation planner, Maui

Testimony: Against SB 709

Committee: Water, Land, Agriculture, and Hawaiian Affairs

Senator Clayton Hee, Chair

Senator Jill N. Tokuda, Vice Chair

Date: Friday, February 27, 2009

Time: 2:45 p.m.

Place: Conference Room 229

Name: My name is Dr. Susan C. Miyasaka. I am an Agronomist and Interim County Administrator, College of Tropical Agriculture & Human Resources, University of Hawaii – Manoa, but I am testifying today as a private citizen. I was the lead scientist in a now-completed research project to genetically engineer Chinese taro Bun long for improved disease resistance. I was born and raised in Hawaii. I grew up eating laulau and poi, and I respect all the diverse cultures found in Hawaii.

Reasons to vote against SB 709:

1. Research to improve disease resistance of taro using all available technologies is needed:

Senate Bill 709 would unnecessarily restrict research to improve disease resistance of taro in Hawaii. This bill states “Over 300 kalo varieties may have existed at the time of the arrival of European explorers. Today, there are approximately 70 varieties of taro...” *Why* did this loss of taro varieties occur?

One major factor was probably invasive pests and diseases, such as Taro Leaf Blight that was introduced into Hawaii during the 1910s. This disease can result in crop losses up to 50% in Hawaii due to loss of leaf area. During the 1990s, when Taro Leaf Blight was introduced accidentally into Samoa, it decimated production of susceptible Samoan taro varieties, causing a 95% loss of yield.

My research team has found that insertion of an oxalate oxidase gene from wheat into Chinese taro Bun long resulted in transgenic lines that completely stopped the spread of Taro Leaf Blight under tissue-culture conditions. These are very promising results, however Senate Bill 709 (as written) would require that these promising transgenic lines be destroyed without allowing further testing.

In addition, new pests and diseases enter Hawaii all the time. It may just be a matter of time before the Alomae-Bobone viral complex found in the Solomon Islands reaches Hawaii. Hawaiian taro varieties were tested in the Solomon Islands and all were killed by this viral complex. The insect vector required to transmit this viral complex is found in Hawaii. Imagine what it would do to our taro production if it reaches Hawaii. It would be foolish to throw away any potential tools that could help to sustain taro production in Hawaii.

2. Genetic engineering (GE) research is a separate issue from commercialization:

Recently, genetic engineering was used in rice to confirm that a rice gene conferred tolerance to prolonged submergence. This gene was transferred into a susceptible rice variety and it was found that tolerance to submergence increased. Then, the scientists used conventional breeding and marker-assisted selection to increase submergence tolerance of commercial rice varieties.

My research team now knows that an oxalate oxidase gene can confer increased tolerance to Taro Leaf Blight. Based on this research, we can look for similar genes found naturally within the taro gene pool and improve disease resistance using conventional breeding and marker-assisted selection. Senate Bill 709 would remove the option of using genetic engineering as a tool to identify important disease resistance genes within the taro gene pool.

3. Risk of accidental movement of transgenes from GE Bun long to Hawaiian taro varieties is practically zero:

Senate Bill 709 is based upon the fear that GE Chinese Bun long taro would somehow contaminate the ‘purity’ of Hawaiian taro varieties. However, Hawaiian taro is grown from ‘hulis’ or vegetative propagating materials. It is not grown from seed. As a result, GE Chinese taro Bun long could be grown side-by-side with Hawaiian taro with practically no risk of accidental movement of transgenes.

Chinese taro Bun long rarely flowers under the environmental conditions in Hawaii. Hawaiian taro rarely sets seed in Hawaii – I have heard or read of only 3 incidences reported over 70 years. For accidental movement of transgenes from Bun long taro to Hawaiian taro, each variety would need to flower simultaneously, then the pollen would need to move from the GE Bun long to Hawaiian taro (despite lack of specialized insect pollinators in Hawaii), and then the Hawaiian taro would need to set seed. I calculated this risk as 2 in a billion (thousand million), or a slightly greater risk than getting hit by a meteorite.

**I respectfully ask that the Senate Committee on Water, Land, Agriculture, and Hawaiian Affairs amend SB 709 to restrict genetic engineering on Hawaiian taro varieties only. This compromise would allow pro-active research to improve disease resistance of taro using all available technologies while respecting cultural concerns of native Hawaiians.**

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**From:** mailinglist@capitol.hawaii.gov  
**Sent:** Thursday, February 26, 2009 8:47 AM  
**To:** WTLTestimony  
**Cc:** us1@kauaigems.com  
**Subject:** Testimony for SB709 on 2/27/2009 2:45:00 PM

Testimony for WTL 2/27/2009 2:45:00 PM SB709

Conference room: 229  
Testifier position: support  
Testifier will be present: No  
Submitted by: Norbert Roessler  
Organization: Individual  
Address: 4184 kekuanaoa Princeville  
Phone: 8088278227  
E-mail: [us1@kauaigems.com](mailto:us1@kauaigems.com)  
Submitted on: 2/26/2009

Comments:  
I am in favor of SB 709.

---

**From:** mailinglist@capitol.hawaii.gov  
**Sent:** Thursday, February 26, 2009 8:47 AM  
**To:** WTLTestimony  
**Cc:** us@kauaigems.com  
**Subject:** Testimony for SB709 on 2/27/2009 2:45:00 PM

Testimony for WTL 2/27/2009 2:45:00 PM SB709

Conference room: 229  
Testifier position: support  
Testifier will be present: No  
Submitted by: Ina Roessler  
Organization: Individual  
Address: 4184 kekuanaoa Princeville  
Phone: 8088278227  
E-mail: [us@kauaigems.com](mailto:us@kauaigems.com)  
Submitted on: 2/26/2009

**Comments:**

I am in favor of SB 709.

---

**From:** mailinglist@capitol.hawaii.gov  
**Sent:** Thursday, February 26, 2009 8:56 AM  
**To:** WTLTestimony  
**Cc:** agres@maui.net  
**Subject:** Testimony for SB709 on 2/27/2009 2:45:00 PM

Testimony for WTL 2/27/2009 2:45:00 PM SB709

Conference room: 229  
Testifier position: oppose  
Testifier will be present: No  
Submitted by: Dean Okimoto  
Organization: HFBF  
Address:  
Phone:  
E-mail: [agres@maui.net](mailto:agres@maui.net)  
Submitted on: 2/26/2009

Comments:



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**TESTIMONY BEFORE THE SENATE COMMITTEE  
ON WATER, LAND, AGRICULTURE, AND HAWAIIAN AFFAIRS**

**SENATE BILL 709, SD1**

**RELATING TO AGRICULTURE**

**PRESENTED BEFORE THE TWENTY-FIFTH LEGISLATURE  
STATE OF HAWAII  
February 2009**

Chairman Hee and Members of the Senate Committee:

**STRONGLY OPPOSE AS WRITTEN.  
WOULD SUPPORT FOR ONLY HAWAIIAN KALO.**

My name is Loren Mochida, General Manager of Tropical Hawaiian Products (THP) in Keaau, Hawaii. THP is a processor and exporter of Hawaiian Premium papayas to CONUS and Japan.

We are strongly opposed to Senate Bill 709 sd1, which prohibits the development, testing, propagation, release, importation, planting, or growing of genetically modified taro in the State of Hawaii. We highly respect the Hawaiian Culture and would support this bill for if this was related to only Hawaiian Kalo. Other farmers welcome research on their varieties.

In the early 1990s, papaya growers were devastated by the Papaya Ring-spot Virus (PRV), which threatened a way of life for hundreds of farmers in Hawaii. A transgenic papaya with virus resistance was created by the UH College of Tropical Agriculture and Human Resources (CTAHR) and Cornell University in New York. These transgenic papayas were finally planted in the late 1990s as new varieties named "Rainbow" and "Sunup. Both of these varieties have saved the Hawaiian papaya industry and have reestablished the grower's papaya farms. The papaya industry and my packing plant would not be operating today if it were not for *biotechnology*.

The taro industry should learn from the papaya industry, that curtailing testing of their crops could be devastating to their industries. Should a foreign pest, disease or virus enter their crops that cannot be controlled by chemicals or integrated pest management (IPM), a new variety developed by biotechnology resistant to that specific pest could save their industry.

People have several choices now of eating various varieties of papaya, from organic, conventional or biotech (Rainbow) papayas. Taro farmers should also have a choice of growing biotechnology crops if it means survival. Ask any Rainbow or Sunup papaya growers.

The "Rainbow" variety has allowed the Kapoho solo variety and assisted in the organic growers to successfully cultivate these non-transgenic papayas by suppressing the PRV pressure in these areas. The Big Island has shown that both the transgenic and non-transgenic papayas can be grown in the same area to complement each other.

We urge the committee to seriously reject passing this bill restricting the advancement of *biotechnology* in Hawaii. Hawaii could become the world leader in agriculture sciences and become the driving force in the state's economy. The state needs to continue to diversify its economy away from an over-reliance on tourism.

Thank you for this opportunity to testify on Senate Bill 709, sd1.



**SB709 SD1: Relating to Agriculture**

DATE: February 27, 2009

TIME: 2:45pm

PLACE: Conference Room 229

TO: Senate Committee on Water, Land and Hawaiian Affairs  
Senator Clayton Hee, Chair,  
Senator Jill Tokuda, Vice Chair

FROM: Lisa Gibson  
President  
Hawaii Science & Technology Council

**RE: Testimony In Opposition to SB709 SD1**

Aloha Chair, Vice Chair, and Members of the Committee,

The Hawaii Science & Technology Council opposes SB709 SD1. The Hawaii Science & Technology Council is sensitive to and mindful of the spiritual and cultural significance of taro in Hawaii. However, while we have respect for the cultural importance of taro to native Hawaiians, and appreciate the inclusion of Section 3 which states that this bill shall not serve as a referendum on the merits of biotechnology nor be applicable to any other crop, we have serious concerns that other groups may use this to set a precedent for a ban on all genetically modified plants and therefore, do not support this bill. Moreover, it is our understanding that the University of Hawaii has already released its patents on non-Hawaiian, disease resistant, traditionally cross-bred, hybrid taro into the public domain and has entered into an agreement to consult with the Hawaiian community before conducting any research on genetically engineered Hawaiian taro.

The life sciences industry in Hawaii plays an important role in diversifying the economy. Hawaii's science and technology business leaders rely on a positive business and community attitude toward science in order to qualify for research grants and attract investment. The growth of Hawaii's science and technology businesses provides opportunities to create higher paying jobs to bring back our children to Hawaii after college education on the mainland. This bill would send an anti-business message, particularly within the science and technology sector. In addition, Hawaii and the nation are pursuing a number of programs designed to increase availability of Science, Technology, Engineering and Math (STEM) education, both locally and nationally to better prepare our future workforce to meet the challenges of today's economy. By banning research, we would send the wrong message to our children, whom we are trying to interest in future careers in science.

*The Hawaii Science & Technology Council (HISciTech) is a 501(c)6 industry association with a 28-member board. HISciTech serves Hawaii companies engaged in ocean sciences, agricultural biotechnology, astronomy, defense aerospace, biotech/life sciences, information & communication technology, energy, environmental technologies, and creative media.*

Sincerely,

Lisa H. Gibson  
President  
Hawaii Science & Technology Council  
(808)536-4670

---

**From:** mailinglist@capitol.hawaii.gov  
**Sent:** Thursday, February 26, 2009 11:03 AM  
**To:** WTLTestimony  
**Cc:** trent@hawaii.edu  
**Subject:** Testimony for SB709 on 2/27/2009 2:45:00 PM  
**Attachments:** sb709.doc

Testimony for WTL 2/27/2009 2:45:00 PM SB709

Conference room: 229  
Testifier position: oppose  
Testifier will be present: No  
Submitted by: Trent Hata  
Organization: Individual  
Address: 289 Makalika Hilo, HI  
Phone: 808-959-2295  
E-mail: [trent@hawaii.edu](mailto:trent@hawaii.edu)  
Submitted on: 2/26/2009

Comments:

Dear Honorable Senator Clayton Hee,

Learn the truth about Genetic modification. Its used in many existing agricultural commodities safely. The clothes we wear, the food we consume, the medicine we take. I would be interested in what your committee has to say in 10 years if SB 709 passes and Taro is wiped out in Hawaii. Sorry, it was a mistake, the people wanted it, we didn't know. It will excuses far too late. Look at all the invasive species coming to Hawaii. The DOA is on the watch for them and they still come in. How easy would it be for a tiny virus to come in? It will. It's like organic farming. There is a place for organic produce but it's impossible to feed everyone by doing everything organic. As an elected official the public entrusted you to make educated decisions for the preservation, safety and good of the people. Save Hawaii's Taro. Vote against SB709. Thank you.

Testimony for WLA 2/27/09 2:45 PM SB709

Conference Room: 229

Testifier Position: Oppose

Testifier will be present: Yes

Submitted by: Rodney Haraguchi, President

Organization: Kauai Taro Growers Association (KTGA)

Address: P. O. Box 427, Hanalei, Hawaii 96714

Phone: (808)826-6202

E-mail: [hvtaro@hawaiiantel.net](mailto:hvtaro@hawaiiantel.net)

Submitted on: 2/17/09

\*Petition can be found at

[SB709\\_SD1\\_TESTIMONY\\_WTL\\_02-27-09\\_LATE.pdf](#)

from page 44 to 52.

Chair Clayton Hee, Vice Chair Jill Tokuda and committee members:

Mahalo for the opportunity to present our testimony, from 42 taro farmers (93% of Kauai taro farmers) representing 396 acres on Kauai that signed this petition, opposing this bill that will place an indefinite moratorium on the research of non-Hawaiian varieties of taro. Our opposition does not mean we are pro GMO. We support the Native Hawaiian culture and agree with UH CTAHR that there be no GMO research on the Hawaiian varieties. We also agree with CTAHR that all research be done in a safe and permitted facility and that no open field test be conducted and that the Hawaiian community is consulted.

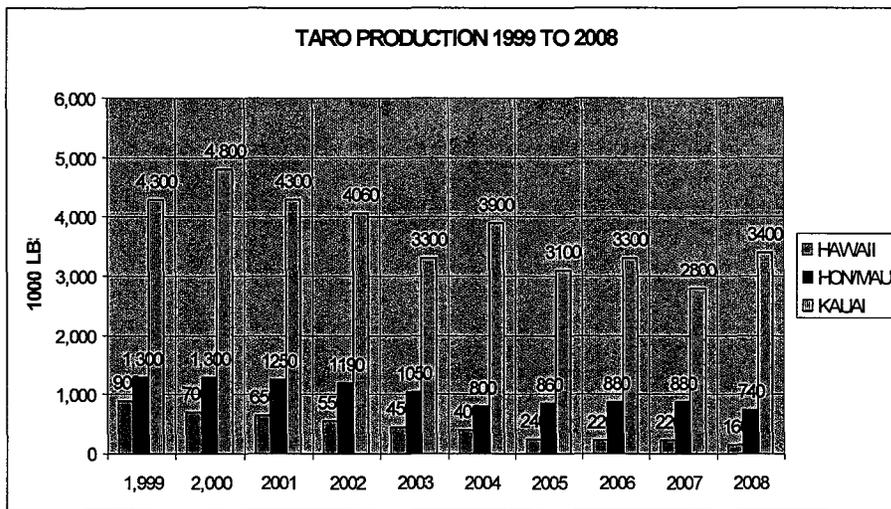
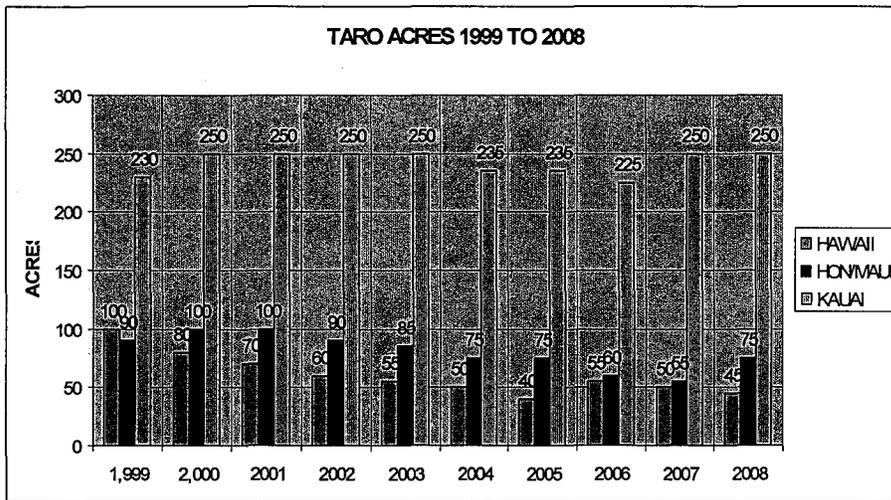
When the bills were first introduced 3 years ago, it was for a moratorium on Hawaiian varieties as a "temporary time out". The 2<sup>nd</sup> year it was for a 10 year moratorium on the Hawaiian varieties which was amended to 5 years. Opposition to the amendment by Hawaii Seed asked members to kill the bill stating, "Genetic engineering would not only be allowed but essentially guaranteed on **other varieties of taro, as well as any and all other crops in Hawaii**. At this point the **bill needs to be killed rather than allowed to pass if there is any chance it will pass.**" This is the 3<sup>rd</sup> year, and now this bill is asking for a moratorium forever on research, on all varieties of taro including the Chinese, Japanese, Puerto Rican and all other taro.

As a 4<sup>th</sup> generation taro farmer, my family is open to options to help our crops survive and our farm and our nonprofit Ho`opulapula Haraguchi Rice Mill, has spent the last two years experimenting with sustainable methods of farming like green manure, cover cropping, organic fertilizers, composting, ground cover and fallowing fields on our State lease land at a cost of over \$100,000 through grants and partnerships. This is a long process that can't happen overnight and must require taro farmers to have enough acreage to fallow and be allowed to fallow according to their leases. The transition is long and costly, but we did it because there is no data available that provides the costs and return on transitioning a taro farm. If it can be proven cost effective, we plan to share this with all the members of KTGA. We also grow organically; some taro, bananas, pineapples, papayas, lemons, oranges and coconuts.

Our daughter, (the 5<sup>th</sup> generation) has her horticultural degree and MBA, returned to Kauai 3 years ago and is our historic mill's Education Coordinator, giving free tours to public and private schools, home schools and other organizations explaining about taro and teaching them how to pound poi. Since starting the free tours we have taught about

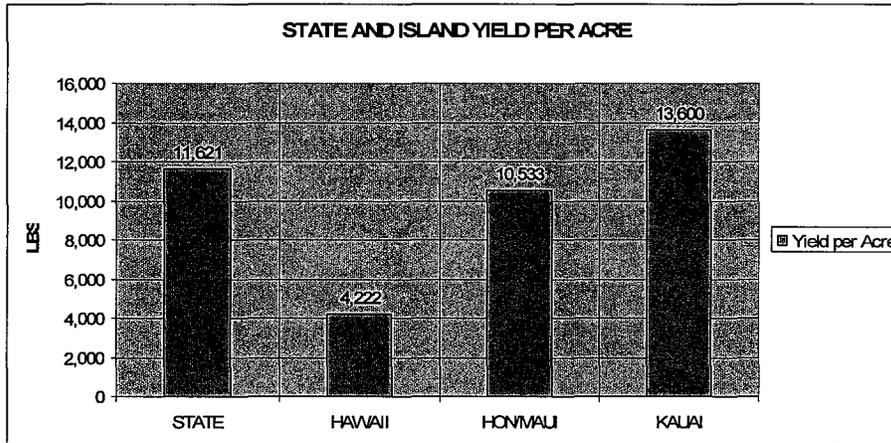
25,000 students over the past 25 years. This has been our way of giving back to our community and educating the public and perpetuating the Hawaiian culture, agricultural history and taro farming. Our son will graduate from CTAHR in May and will be working for the Natural Resource Conservation Service to assist other farmers and ranchers about soil and water conservation and would like to come back to farm taro. That is why it is important to make the taro industry strong and viable for all the young people that want to farm taro. For the past 12 years, KTGA has provided scholarships for students interested in furthering their education in agriculture and funding travel for students competing at the International Science Fair and Symposiums with taro projects.

According to the USDA, National Agricultural Statistic Service (NASS), taro production is at a tipping point and without continual research and assistance may never recover to the 6,800,000 pounds harvested in the year 2000 as compared to the 2008 harvest of 4,300,000 pounds, a **short fall of 2,500,000 pounds**. Taro farming is one of the hardest and labor intensive occupations and vulnerable to the weather, agricultural theft, apple snail, diseases, water shortages, irrigation ditch repairs, increased supply costs and labor shortage.



As you can see from the charts, taro production is declining on all the major islands with the exception of Kauai. And Kauai produces 78% of the state's taro supply.

According to the 2008 USDA, Hawaii field office statistics, the following graph depicts the average yield (pounds of taro) per one acre. Kauai taro farmers yield per acre was the highest and above the state average.



Throughout the past seventeen plus years, Kauai taro farmers have worked closely with CTAHR and provided access to their fields for research to improve their crop yields, find solutions for apple snail infestations and diseases, and test different Hawaiian varieties and different hybrid varieties of taro that will produce the best poi possible. As science progresses, new methods have developed that will provide taro farmers with different options. This research provides the hope to continue this very difficult job and to pass it on to the next generation. If not, **who will provide the taro and poi?**

We agree with CTAHR that there be no research on the Hawaiian varieties for respect to the Hawaiian culture. The taro farmers are asking for help to preserve their livelihood and future, by not imposing an indefinite moratorium on the other varieties that may someday provide an answer to a disease or problem that may occur. To start research at the time of occurrence will be too late and time will be wasted to undo the moratorium while the taro crops decline.

There are some inferences that the commercial farmers are only after the money and profit, but that is not the case. At up to \$8.99 per pound of poi in Hawaii, the farmers are only receiving 6% of that at \$.60 per pound. In my perspective, every farmer, whether big or small, full time or part time, works hard and I respect them for continuing this way of life. In doing so, this is the farmers' satisfaction, is having the consumers enjoy our product. **Statistics show the declining trend for taro farming in Hawaii and the taro farmers need help and are asking for help so that you will not say to us, "Why didn't you tell us?" And what will be the answer when the poi consumers ask, "Where's our poi, what happened to our taro? Where are the taro farmers?"**

Subject: SB709, WTL, February 27, 2:45 p.m., Conference Room 229

Dear Chair Senator Clayton Hee,

Thank you for this opportunity to testify against SB709 as amended. I respectfully ask you and your committee members to amend SB709 back to its original version that banned genetic engineering of Hawaiian taro varieties only and named these varieties specifically. The bill as originally written was a good compromise that respected the cultural beliefs of native Hawaiians while allowing needed research to improve disease resistance of non-native taro varieties.

There are deadly diseases in the South Pacific that could wipe out taro production in Hawaii if they ever reach our islands. Scientists need to be allowed to conduct pro-active research to improve disease resistance using all available technologies, before a crisis situation exists. It took only 15 years after accidental introduction of the Alomae-Bobone viral complex to wipe out taro production in Makira Island in the Solomon Islands. All Hawaiian taro varieties have been tested and all are susceptible to the Alomae-Bobone viral complex.

Please save taro in Hawaii by voting against SB709 or amending it to ban genetic engineering of Hawaiian taro varieties only.

Thank you,

Cathy Mello

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**From:** mailinglist@capitol.hawaii.gov  
**Sent:** Thursday, February 26, 2009 12:02 PM  
**To:** WTLTestimony  
**Cc:** hxlyy@hotmail.com  
**Subject:** Testimony for SB709 on 2/27/2009 2:45:00 PM  
**Attachments:** taro\_testimony.odt

Testimony for WTL 2/27/2009 2:45:00 PM SB709

Conference room: 229  
Testifier position: oppose  
Testifier will be present: No  
Submitted by: Xiaoling He  
Organization: Individual  
Address:  
Phone:  
E-mail: [hxlyy@hotmail.com](mailto:hxlyy@hotmail.com)  
Submitted on: 2/26/2009

Comments:

---

**From:** mailinglist@capitol.hawaii.gov  
**Sent:** Thursday, February 26, 2009 12:12 PM  
**To:** WTLTestimony  
**Cc:** ronfitchtango@hawaii.rr.com  
**Subject:** Testimony for SB709 on 2/27/2009 2:45:00 PM  
**Attachments:** taro\_testimony\_m.odt

Testimony for WTL 2/27/2009 2:45:00 PM SB709

Conference room: 229  
Testifier position: oppose  
Testifier will be present: No  
Submitted by: Maureen Fitch  
Organization: Individual  
Address:  
Phone:  
E-mail: [ronfitchtango@hawaii.rr.com](mailto:ronfitchtango@hawaii.rr.com)  
Submitted on: 2/26/2009

Comments:

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**From:** mailinglist@capitol.hawaii.gov  
**Sent:** Thursday, February 26, 2009 12:16 PM  
**To:** WTLTestimony  
**Cc:** terry1@hawaii.rr.com  
**Subject:** Testimony for SB709 on 2/27/2009 2:45:00 PM  
**Attachments:** taro\_testimony\_r.odt

Testimony for WTL 2/27/2009 2:45:00 PM SB709

Conference room: 229  
Testifier position: oppose  
Testifier will be present: No  
Submitted by: Terry1 Leong  
Organization: Individual  
Address:  
Phone:  
E-mail: [terry1@hawaii.rr.com](mailto:terry1@hawaii.rr.com)  
Submitted on: 2/26/2009

Comments:

Thomas T Shirai Jr  
P O Box 601  
Waialua, HI 96791  
Email: [Kawaihapai@hawaii.rr.com](mailto:Kawaihapai@hawaii.rr.com)

Hearing Notice  
Friday, February 27, 2009 / State Capitol Conference Room 229

Senate Committee on Water, Land, Agriculture & Hawaiian Affairs (WTL)  
Senator Clayton Hee, Chair / Senator Jill Tokuda, Vice Chair

RE: Testimony of Strong Support for SB 709 SD1 (Relating to Agriculture)

Aloha Chair Hee, Vice Chair Tokuda & Committee Members,

As a lifetime resident of *Mokule'ia Ahupua'a*, I strongly support SB 709 SD1 because our *Po'e Kahiko* had proprigation without chemical enhancement that didn't have an adverse effect on an *Ahupua'a*.

My *Grandfather* and his *Kupuna* were *mahi'ai* (farmers) which included *Taro* cultivation and productivity. It's only within the last 3-5 years that *GMO* (*Genectically Modified Organism*) wetland *Taro* (*Kalo*) was being grown in *lo'i* encompassing about 1-2 acres here in *Mokule'ia Ahupua'a*. The residue from the *lo'i* goes to the ocean. Additionally, there is a large *aquafier* beneath *Mokule'ia*:

*Archeology of Oahu – Bulletin 104 by G McAllister (1933)*  
*Site 196. "In the valley near the mountain side of the Greenfield House was once evidently a large Hawaiian settlement...Water freshets have also obliterated many remains.."*

*The Hawaiian Planter – E S Craighill Handy (1940)*  
*Mokule'ia. "There are two extensive old terrace areas in Mokuleia on the flatland near the sea. One is just below the Dillingham Ranch, watered by an underground flow.."*

Verse 2 of *Kalena Kai* composed by *King Liholiho* during his 1820 visit to *Mokule'ia* was not intended to be interpreted as *GMO* crops productivity but genuine agricultural sustainability which included *Taro* (*Kalo*) productivity:

*Kalena Kai – Chant composed by King Liholiho*  
*'O ka ehu, ehu o ke kai – The sea spray*  
*Ka moena pawehe o Mokule'ia – Geometric designs of the plains of Mokule'ia*

*Mahalo* for the opportunity to strongly support SB 709 SD1. *Malama Haloa.*  
*Thomas T Shirai Jr*  
*Mokule'ia, Waialua*

*Kawaihapai Ohana*  
*c/o Thomas T Shirai Jr*  
*P O Box 601*  
*Waiialua, HI 96791*  
*Email: [Kawaihapai@hawaii.rr.com](mailto:Kawaihapai@hawaii.rr.com)*

Senate Committee on Water, Land, Agriculture & Hawaiian Affairs (WTL)  
Senator Clayton Hee (Chair) /Senator Jill Tokuda (Vice Chair)

Notice of Hearing  
Friday, February 27, 2009  
2:45 PM / State Capitol Conference Room 229

RE: Testimony Supporting SB 709 SD1 (Relating to Agriculture)

*Aloha Chair Carroll, Vice Chair Shimabukuro & Committee Members,*

*The Kawaihapai Ohana is a Recognized Native Hawaiian Organization (NHO) by the Department of Interior (<http://www.doi.gov>) and its kuleana includes cultural and historical preservation applicable to Kawaihapai Ahupua'a. Some of the Kupuna of Kawaihapai were Taro (Kalo) mahiai (farmers) and were Cultural Informants for Bishop Museum who provided information about Waiialua Moku:*

*The Hawaiian Planter by E. S. Craighill Handy (1940) – Page 85*

*“Kaaimoku Kekulu (sic: Kaaemoku Kakulu), native of the district says that the name of spring and the terrace section noted above is Kaaiea.”*

*Kawaihapai. “There is a sizable area of terraces in the lowlands (now surrounded by sugar cane), watered by Kawaihapai Stream. These terraces have evidently been lying fallow for some time, though several were being plowed for rice or taro in the summer of 1935. At the foot of the cliffs, watered by a stream the name of which was not learned, are several small terraces in which taro is grown by David Keaau (sic: David Keao).”*

*The Kawaihapai Ohana supports SB 709 SD1 because our ancestors had a more traditional, effective and respectful way regarding this matter for many generations. Growing GMO Taro, has a direct affect upon an entire Ahupua'a System when the water from the lo'i goes in the kahawai (stream), muliwai (head water) and kahakai (ocean) affecting our seafood subsistence including all marine life. This has quietly and potentially affected Mokule'ia and the Northwest Coastline of Waiialua Moku.*

*Verse 2 of the chant entitled Kalena Kai ([http://huapala.org/KAL/Kalena\\_Kai.html](http://huapala.org/KAL/Kalena_Kai.html)) composed by King Liholiho in 1820 which describes the agricultural productivity of Mokule'ia was not meant to be interpreted as Genetically Modified Crops:*

*Kalena Kai by King Liholiho (1820) – Verse 2*

*'O ka ehū' ehū o ke kai – The sea spray*

*Ka moena pawehē o Mokule'ia – Geometric designs of the plains of Mokule'ia*

Thank you for the opportunity to provide testimony supporting SB 709 SD1. *Malama Haloa.*  
*Thomas T Shirai Jr*  
*Kawaihapai Ohana – Po'o*

Testimony Presented before the  
COMMITTEE ON WATER, LAND, AGRICULTURE, AND HAWAIIAN AFFAIRS  
Senator Clayton Hee, Chair  
Senator Jill N. Tokuda, Vice Chair

DATE: Thursday, February 27, 2009  
TIME: 2:45 p.m.  
PLACE: Conference Room 229  
State Capitol  
415 South Beretania Street

by

Richard M. Manshardt, Professor  
Department of Tropical Plant & Soil Sciences  
College of Tropical Agriculture and Human Resources  
University of Hawai'i at Mānoa

RELATING TO AGRICULTURE, placing a moratorium on the growth of  
genetically modified taro plants.

My name is Richard Manshardt. I am a professor and plant geneticist in CTAHR at UH Manoa. I have 25 years of research and teaching experience in crop sciences at UH, including work in conventional crop breeding and the development of genetically engineered virus-resistant papaya varieties for Hawaii growers. I am providing testimony on my own behalf, not officially presenting the position of CTAHR or UH on this bill.

**I respectfully oppose SB709.**

Most of the text of this bill tells of the spiritual significance of taro in the Hawaiian culture. The drafters of the bill hold the taro plant in special regard, connecting it with the origin of Hawaiian culture, much as others in our multicultural society place the body and blood of Jesus Christ in the central role of the Christian community. We are guaranteed our freedom of belief by the first amendment to the US Constitution, and this is good and right.

But if one group's beliefs are used to justify restricting the actions of others, that may not be good or right. The stated objective of SB709 is to impose a moratorium on research or production of genetically engineered Hawaiian taro, but there is no logical development of ideas to show why a moratorium is appropriate. The bill doesn't explain the connection between taro's spiritual importance and genetic engineering, so the reader is left to conclude that the drafters of the bill want the moratorium because genetically engineered taro violates their belief in a genealogical relationship to taro. The bill basically says, "You can't use genetic engineering to improve taro, because we don't like that idea, and no other justification is needed."

Because agriculture is dynamic, with crop varieties, weather conditions, and pests that influence production changing from year to year, researchers need all the tools they can get to protect and improve farm production. In my experience, genetic engineering is a useful, effective, and safe tool for crop improvement. Genetic engineering is not appropriate for all breeding objectives and is not going to replace conventional breeding methodologies based on cross-pollination, but a moratorium on its application to taro or any other crop is not going to serve the long term interests of growers or consumers in Hawaii. At a minimum, we need to be able to do genetic engineering research to properly evaluate the risk/benefit ratio of this approach in improving taro. Please remember that new variety development, whether by conventional means or genetic engineering, is a decade-long process and cannot be turned on and off arbitrarily.

The legislature has a clear role here to support the concept that technical problems need to be addressed and resolved in a scientific context, where logical thinking based on experimental data is foremost, rather than religious, cultural, or political considerations.

Thank you for this opportunity to testify, and **I ask you to please vote against SB709.**

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**From:** walter ritte [rittew@hotmail.com]  
**Sent:** Thursday, February 26, 2009 1:15 PM  
**To:** WTLTestimony  
**Subject:** Testimony

Hearing Friday Feb. 27, 2009 2:45pm Committee on Water Land Agr. and Hawaiian Affairs

~~SB 633~~

~~My Name is Walter Ritte, and I am in strong support of this Bill. The purpose of the Molokai Irrigation System was to serve Native Hawaiian Homesteaders. The vast majority of the water is being used by non homesteaders. The advisory board is stacked against homesteaders and the last two years have seen the board go against homesteader interest and leadership, Even the department of Ag. has been at odds with homesteaders on legislative issues regarding the MIS.~~

SB1199

I am in strong support of this bill. Fishing presure, sediment run off, global warming and other factors has depleted the food resources in the ocean. Mahagement plans for the shoreline of all islands is needed to change this trend. Molokai would like to begin that process to insure food security for their future generations.

SCR44 and SR26

I am in strong support of these resolutions. This is a very good report, it is well done and accurate. It has excellent recomendations for solutions to many problems facing the reef system of Molokai. The recommendations will increase the food security for Molokai, create many green jobs and protect the land and sea.

SB 709, SD1

I am in strong support of this bill. Taro is not just a plant to Hawaiians, it is important to understand the sacredness and family ties Hawaiians have with the taro. To not understand this relationship will translate into major future problems in agriculture. The Hawaiians are united in their responsibilty to protect Haloa the taro, and we do not want our family member genetically modified.

Mahalo for this opportunity to testify on these important bills. Walter Ritte

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**From:** Chris Kobayashi [waioli2@hawaiiantel.net]  
**Sent:** Thursday, February 26, 2009 1:21 PM  
**To:** WTLTestimony; Sen. Fred Hemmings; Sen. Dwight Takamine; Sen. Russell Kokubun; Sen. Carol Fukunaga; Sen. Robert Bunda; Sen. Jill Tokuda; Sen. Clayton Hee  
**Subject:** Ban on GMO Kalo

Aloha Senators and Representatives

-Kalo is a hypoallergenic food.  
If you mess around with that, it ain't going to be hypoallergenic anymore.

-GMO kalo will contaminate our organic taro.  
Take away our livelihood.  
We cannot coexist.

-GMO proponents are only thinking about chemicals and their pockets.

-It's not going to be a pure taro anymore.  
Pure taro is going to be like an artifact.  
You will only find it in the museum.

Please support a BAN on GMO KALO in Hawaii.

Mahalo,

Demetri Rivera  
Kalo farmer  
Wai'oli, Hanalei, Kaua'i

Member of Onipa`a na Hui Kalo, an inclusive statewide organization which has been helping farmers, gardeners, consumers, children, next generation kalo growers to malama `aina, malama haloa and malama kalo.

Presently member of Kauai Taro Growers Association (KTGA), which does NOT represent my views on kalo.

## Testimony AGAINST

SB709

Genetically Modified Organisms; Taro

by

Mr. Mario Patiño, MCLS, Science Educator and Private Citizen,

I thank you for the opportunity in presenting testimony in regards to SB 709 currently under consideration by the Hawaii State Senate. I write in **OPPOSITION** of this Bill's passing for the following reasons

- The language in the related to unique varieties of taro have has not been determined by genetic analysis. The varieties mentioned may not be Hawaiian in origin but hybrids of other taro varieties that are not culturally significant to Hawaiian people.
- Hawaiians and non Hawaiians have been genetically modifying taro for hundreds of years using traditional methods in agriculture specifically the use of artificial selection to produce varieties known today. **All** taro are derivatives from wild type varieties found in Southeast Asia. These varieties have been produced through domestication and genetic manipulation. **ALL HAWAIIAN TARO** are genetically modified varieties of the original plants that came from Southeast Asia. The language of this Bill is flawed since any genetic manipulation (ancient or modern) would limit maintenance and enhancement of current taro cultivars. Hawaiians have genetically modified taro plants for hundreds of years, a moratorium would cause traditional and non traditional methods of agriculture illegal.
- Modern methods of genetic manipulation may be needed to maintain genetic diversity of Hawaiian taro because current agricultural practices **do not** promote genetic diversity which has resulted in inbreeding depression. Hawaiian taro is more prone to disease and pathogenesis due to limited genetic diversity.

Thank you for the opportunity to testify  
Mario Patiño  
Science Educator and Private Citizen

**OPPOSITION Testimony for SB709**  
**Patiño, M.**

**TESTIMONY**

**SB 709 SD 1**

**(END)**