Strauss Scholarship Application

Preserving Biodiversity and History: Creating a West Coast Seed Library at UC Santa Cruz

I. Background and Context: The Genetic Desert

Biodiversity is an integral part of any healthy ecosystem. Having a diverse gene pool is life's natural means for coping with potent diseases, environmental stress, and quick changes in the ecosystem. Genetic diversity is the key to biological success for any species. Much of humanities current relationship with food fails to recognize this sublime biological truth. Our current food system promotes massive contracted monocultures that a few key distributors package and send throughout the nation and world. In fact humanities "modern" food system is dependent on only about 150 plant species, 12 of which provide three-quarters of the planets food supply! Furthermore the IDRC reports, "More than half of the world's food energy comes from a limited number of varieties of three mega-crops: rice, wheat, and maize." [1] If one of these massive crops were to succumb to disease or blight massive famines could become a reality. While the monocultures of the 20th and 21st century have produced the highest overall yields of crops humanity has ever known, this system is a desert when one considers the merits of genetic diversity and the long term resilience of a food supply.

The genetic diversity of the world's food system has been steadily decreasing for some time now. Scientists estimate about 15 plant species go extinct every day, including plants that people use to eat.[2] Replacing biodiversity and thousands of years of work by farmers is the industrial monoculture. Modern seed companies are offering fewer options for farmers because the demands by big companies for one type of potato or corn. Furthermore genetic engineering giants like Monsanto are patenting seeds; making it illegal for farmers to keep GMO seeds for next years crop.

Perhaps the biggest threat to crop biodiversity in the immediate future lays in the fact that heirloom and organic products are being cross-pollinated by GMOs, destroying the genetic integrity of the crop. When one considers Monsanto has put out a self-terminating seed, the implications are harrowing. The terminator seed kills itself and cannot reproduce. If this genetically engineered trait were to contaminate non-GMO crops, the results could be disastrous, destroying biology, culture, and the independence of farmers who currently do not buy from seed companies.[3]

To combat these dangers, seed saving networks across the country have been established with the sole intention of preserving regional crops and biodiversity.[4] A seed library is a place where plant genetics, in the form of seeds, are stored for research purposes and use for the public. A farmer or interested gardener borrows a certain amount of seeds, grows them into a crop, and returns the same amount of seeds he or she borrowed the next year. A seed library is a means by which a region can store the genes of its traditional heirloom varieties, teach the public about farming and biology, and store alternative species of plants in case a widely used variety succumbs to a new disease or pest. UCSC has the capacity to serve as a site for a Northern Central Coast regional seed library. At UCSC we are fortunate enough to have the Center for Agroecology and Sustainable Food Systems, which has existed for over forty years serving small scale and alternative

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[1] "Facts and Figures on Food and Biodiversity." *International Development and Research Council.* N.p., n.d. Web. 25 Jan 2011. <http://publicwebsite.idrc.ca/EN/Resources/Publications/Pages/ArticleDetails.aspx?PublicationID=565>.

[2] "Biodiversity: Seeds=Life." *Sacred Earth Botany* . N.p., n.d. Web. 1 Jan 2011. <http://www.sacredearth.com/ethnobotany/conservation/seeds.php>.

[3] Shiva, Vandana. *Stolen Harvest*. 1st. Cambridge, MA: South End Press, 2000. 79. Print.

[4] http://www.seedsavers.org/

agriculture. Having a seed library at UCSC would allow farmers in the region to store their genetics in a safe place, facilitate research and programming in conjunction with CASFS and course based learning, as well as give the public access to valuable seeds for backyard and urban gardening initiatives.

II. The Main Reasons for Storing Seeds

A. Biodiversity

It is almost inevitable that a disease will mutate and wipe out a massive amount of any one plant species; including our staple monocultures such as corn, rice, and wheat. This is even true for genetically modified crops. Yes diseases and pests will be deterred in the short run, but these diseases and pest will soon mutate becoming resistant to the engineered genome changes.

There are many historical examples of the dangers of monocultures. The Irish potato famine stemmed from this very same issue. British landowners in Ireland at the time forced a majority of Irish farmers to grow one type of popular potato. In 1845 a particularly intense potato blight wiped out nearly all the crop in Ireland, precipitating one of history's most infamous famines. It is very likely that in time, an event like this will occur again. If it happens to one of the vast monocultures produced by the industrial food system, humanity will have to find alternatives.

B. Preserving local heritage and tradition

Another goal of having this seed bank would be to preserve some of the West coasts rare plant genetics. Many traditional seed varieties are disappearing and must be collected and studied before they are lost. Preserving the West coasts seed genetics is preserving ancient time-honored food and culture. Furthermore, because this seed library will be run by a public university, the public will have access to seeds and other resources otherwise not available.

C. GMO's do not adequately address long-term food security

The reason why genetically modified plants do not adequately address the long-term security of our food system is because genetic engineering companies ignore the importance of biodiversity. Large multinationals function to make a few key products and sell these products as much as they can. These companies push their particular "enhanced" monocultures. However, even these crops are still susceptible to mutating and evolving disease, blights, and pests. In fact, research conducted at the University of Arizona suggests that pests seemingly wiped out by GMOs are merely temporarily killed off in large numbers, but eventually come back as stronger heartier animals and are even harder to wipe out.[5] Viruses function the same way. Scientists must come up with a flu shot every year to account for the mutations the dominant flu virus has made in the time preceding the new flu season.

The wisest way to combat pests and disease is to use methods that destroy pests, blights, and diseases in a genetically random fashion so a new heartier strain does not develop. Furthermore by intercropping, using integrated pest management, and maintaining genetic diversity humans can better predict, in the long term, the patterns and trends of pests and disease. We can thereby diminish the impacts of these problems by learning to live with a small population of pests and/or diseases.

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[5] "Organic Consumers Association." *Scientists Find Evidence of Pest Resistance to GMO Crops*. N.p., 08 03 2008. Web. 25 Jan 2011. <http://www.organicconsumers.org/articles/article_10175.cfm>.

III. My Background and Orientation:

I have been involved with the UCSC Food System Working Group (FSWG) since 2009 and have developed a strong desire to work with local food producers, distributors, and consumers. I have facilitated workshops, assisted with designing and implementing conference sessions and events engaging diverse stakeholders, as well as guide student interns working for FSWG. Further, through the Food System Working Group I have had the opportunity to meet local farmers, learn about alternative forms of agriculture, lead tours, work on political campaigns, and connect with my community in ways I had not considered as a student entering UCSC three years ago. During the course of my food system education and appreciation of agriculture I have become attentive to the role of seed and its impact on the future of our food system. As noted above in my brushstroke overview of seed diversity: we are facing a historic crossroads where we may "seed" the future of our farming systems or lose the genetic diversity and base of our organic seed supply. In February I am co-hosting a regional seed diversity discussion at our local Grange to better understand interests and needs in making a seed library helpful and relevant to our diverse community of farmers, gardeners, and seed savers.

Students at UCSC are very interested in working on projects addressing problems in the food system from composting to procurement. To fund implementation of different campus food system based visions, last year, I played a key role in a campaign for spring student elections to introduce a funding measure (i.e. Ballot Measure 43). Measure 43 adds a $3.75 fee to every student's tuition to permanently support student driven research & education into health, vellness, and sustainable food systems. This measure passed, with a record number of students voting in the election and has rapidly increased participation and engagement in efforts at UC Santa Cruz. With respect to my Strauss proposal I anticipate bridging community needs/stakeholders with campus resources and networks and utilizing Measure 43 funds, once the project is established, for ongoing funding. By developing a Seed Library that will be institutionalized it will serve beginning and immigrant farmers, student gardens, and backyard gardeners and provide a missing link in our regional food and farming system. Next spring I will host a symposium on seed saving and feature the opening of the seed library project to culminate the year's work ahead!

IV. Plan Overview:

My goal, if given a Strauss grant, is to establish a seed library for heirloom and rare species of West coast plants and crops and build a clear structure and process for student and community engagement that will live on well beyond my leadership and development. There are already a number of interested local stakeholders and community members who have their own private seed collections and would be interested in supporting a public seed library. In the initial phase of my plan I will connect with seed saving focused organizations and small to mid-sized farmers across the Western United States, to catalog the history of certain seeds and bring samples back to our future library. Further, I will be working with 7-10 regional farmers willing to propagate seed varieties for the library in an ongoing basis. These farms have an existing research and education relationship with UCSC and I've been in touch with them about this opportunity and have noted interest! In addition, I have the institutional support of the Center for Agroecology and Sustainable Food Systems at UC Santa Cruz, which would eventually take a leadership role at UCSC with the regional seed library. CASFS farm

apprentices and students at UCSC and Cabrillo Community College (i.e. through their Horticulture Center) would have a huge array of opportunities for seed trials and crop research that integrates co-curricular programming with relevant classes. I envision the institutionalization of a seed library by CASFS at UC Santa Cruz to serve multiple audiences (i.e. staff, students, classes, farmers, & community members). At present, there are two potential locations for this seed bank. Either at the CASFS farm or at the Live Oak Grange located a few miles from campus. Development of the site and final plans would be undertaken within the first two phases of my Strauss Proposal. Subsequent efforts in Phases III & IV will include seed propagation initiatives on local farms, an active web presence for documentation, communication, and capacity building; internship training, coordination, and a guiding manual; linking ongoing funding and resources for the project; hosting a regional seed symposium; and evaluating the project and its impacts.

I will be working directly with farmers, small seed stockers, and ecologists in the region to create a seed library that is accessible to the public. My goal is to create a library that farmers can actually use and something that will improve the long-term security of the food system by promoting biodiversity and traditional knowledge. The time has come for a Central Coast university to start preserving the genetics of some of its most treasured heirloom varieties and UC Santa Cruz will serve as the historic site in conjunction with community partners.

TIMELINE

April-July2011 (Phase One): Initiate Strategic discussions among the USCS community, NGO allies, and local farmers about the design & program for a regional seed library. Establish a campus-community task force. Confirm with CASFS and stakeholders the location and site specifics for the library. Plan a month long trip through California, Nevada, New Mexico, Oregon, and Washington farms to meet farmers & NGP seed entities to collect seed samples & gather relevant info for my project. Converse with course instructors to lay out preliminary plans for fall, winter, and spring co-curricular programming.

July-September 2011 (Phase Two): Finish an assessment of site planning & implementation needs & costs (will be using a seed storage container of 10' by 30') which requires no construction & incurs a monthly rental fee of less then $80 per month). Undertake the field research journey catalog the different types of seeds and crops, take pictures, collect small seed samples, hear stories from the farmers, & gather propagation & storage techniques as well as education & marketing resources (middle of July-middle of August). Return to Santa Cruz and provide trip report & presentation to task force CASFS, and interested seed savers (September)

October-December 2011 (Phase Three): Break ground on site for the new library on the farm or at the grange. Assess regional seed stock & develop propagation plan with local organic farmers. Initiate co-curricular seed education program at UCSC. Plan for spring seed symposium and identify intern support and services.

January-March 2012 (Phase Four): Develop web catalog of the Northern Central Coast Seed Library & online presence (February). Lead a 2-unit UCSC course on seed saving, genetic diversity, & sustainable food systems (January-March).

Finalize the institutional structure of the seed library. Train student seed library interns and develop internship manual. Use local media to publicize the new seed bank & host community symposium on seed (March). Use measure 43 funds to pay for upkeep and organization of library and continuation of project for subsequent years.

April 2012: Strauss Spring Meeting and Report

Budget

Travel $1750

Travel includes expenses incurred during seed collection and research trip (i.e. cost of travel, food, lodging, seed purchasing funds).

Seed Bank Site Establishment $4000

Renting seed storage unit (covers one full year plus option for extension), developing & printing marketing and education materials, program materials, and related expenses.

Symposium Event $500

Event related costs--materials, promotion, travel assistance for speakers, etc...

Stipends for web design assistence, interns, and catalog creator $2000

Covering design assistance (i.e. web homepage and seed catalog system) and intern stipends for first year.

*In-kind support will include hosting site space for library, staff support and advising, some seed donations, and collaboration with classes for co-curricular programs

TOTAL ----- $8,250