
A BILL FOR AN ACT

RELATING TO INTEGRATED STRATEGIES FOR STATEWIDE FOOD AND ENERGY
CROP PRODUCTION.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF HAWAII:

1 SECTION 1. The legislature finds that with growing
2 concerns over Hawaii's dependence on fossil fuels to satisfy its
3 agriculture and energy needs, it is increasingly in the State's
4 best interest to address these problems through integrated
5 strategies that are cost competitive. One solution to Hawaii's
6 dependence on fossil fuels for fertilizer and energy is the
7 utilization of charcoal produced locally from biomass as a
8 permanent soil additive.

9 The Hawaiian Islands, particularly the older islands such
10 as Kauai, have heavily-leached soils with very low nutrient
11 content and almost no potassium or phosphorus available for
12 potential uptake by vegetation or agricultural crops.
13 Agricultural crop yields for use as food and clean energy
14 feedstocks are strongly dependent on sufficient levels of
15 available nutrients for plant uptake. Thus, a major determinant
16 of a successful and sustainable agricultural venture in Hawaii
17 will be achieving an adequate, sustainable fertilizer regime.



1 The use of biomass-derived charcoal as a tropical soil
2 additive has been verified by modern science as a carbon
3 negative process and used for agricultural purposes since
4 ancient times by indigenous communities in other tropical
5 regions around the world. Activities, like charcoal formation,
6 are carbon negative in that carbon in the form of carbon dioxide
7 or methane gas (greenhouse gases) can be permanently sequestered
8 in the manufactured charcoal. This is significant because the
9 combustion of fossil fuels for activities like transportation
10 and electricity generation has led to unnaturally elevated
11 concentrations of carbon dioxide and other greenhouse gases
12 being released into the atmosphere. These gases persist in the
13 atmosphere, trapping warm air that would otherwise have
14 dispersed beyond the earth's atmosphere into space,
15 unfortunately causing human-induced global warming. Formal
16 economic models estimate that if we do not act now to counter
17 human-accelerated global warming, the negative cost to global
18 ecosystems, society, and our economy will likely be substantial.

19 It is possible that through the production process of
20 biomass-derived charcoal for soil nutrient enhancement purposes,
21 positive net energy may be produced to satisfy community
22 electrical needs while at the same time reducing carbon dioxide



1 levels in the atmosphere. This process has the potential to not
2 only assist in reducing Hawaii's dependence on petroleum-based
3 products, but also decrease the absolute quantities of
4 fertilizer that need to be applied to agricultural lands for
5 crop production. This suggests that runoff from agricultural
6 lands may in turn contain lower levels of nutrients that in high
7 concentrations are known to have significant negative impacts on
8 freshwater and marine ecosystems. Additionally, large
9 quantities of carbon can potentially be sequestered through the
10 production of charcoal soil enhancements, thereby permanently
11 sequestering carbon-based greenhouse gases being emitted into
12 the atmosphere and contributing to human-induced global warming.

13 Therefore, comprehensive agricultural management strategies
14 would not only lead to long-term economic stability of Hawaii's
15 agrarian-based industries, but also facilitate positive
16 stewardship of state lands by reducing levels of contaminated
17 sediments in statewide waterways and surrounding ocean waters,
18 as well as greenhouse gases building up in the atmosphere
19 causing accelerated global warming.

20 Further, integrated agricultural management strategies
21 build partnerships between local communities and state and
22 federal agencies and strengthen the overall economy as well as



1 statewide environmental protection efforts. State funds
2 appropriated for the research and development of a pilot project
3 and associated community outreach technologies have the
4 potential to obtain matching federal funds from existing
5 programs such as the Environmental Protection Agency, United
6 States Department of Agriculture, United States Department of
7 Energy, Farm Service Agency, and National Science Foundation.
8 Investments from private industry may also be available due to
9 the economic viability of taking these newly-emerging
10 technologies quickly to market.

11 The purpose of this Act is to appropriate funds during
12 phase 1 to develop and demonstrate ecologically-sustainable
13 strategies to amend soil fertility for the production of clean
14 energy feedstocks and food crops and to create public engagement
15 mechanisms and tools to educate the public about sustainable
16 agriculture issues faced by the state and move towards
17 stakeholder consensus; and during phase 2 to secure funding and
18 coordinate the implementation of an ecologically-sustainable
19 dual-purpose soil additive and energy production facility pilot
20 project.

21 SECTION 2. During phase 1, scientists with the University
22 of Hawaii center for conservation research and training shall



1 conduct research and development, as well as monitor the
2 ecological impact of strategies being researched and tested.
3 This work shall identify and test charcoal additive strategies
4 consistent with integrated watershed management practices to
5 establish the best means to improve the nutrient levels in
6 soils, lessen the State's dependence on imported fossil fuels,
7 sequester carbon in the atmosphere, and mitigate existing
8 problems, such as nutrient flows into waterways.

9 The phase 1 integrated research of potential soil nutrients
10 enhancement strategies and mechanisms conducted by stakeholders
11 shall include but not be limited to:

- 12 (1) Physical, chemical, and biological soil
13 characteristics;
- 14 (2) Carbon sequestration in relation to global warming;
- 15 (3) Software and web-based stakeholder engagement tools;
- 16 (4) Existing and future agricultural land uses;
- 17 (5) Relevant community organizations and functions; and
- 18 (6) Relevant state and federal institutional functions.

19 During phase 2, the center for conservation research and
20 training shall identify and solicit federal funds and other
21 funding methods and shall coordinate the pilot-scale
22 demonstration project and ecological monitoring of the dual-



1 purpose soil additive and energy production facility pilot
2 project developed during the phase 1 research and development.

3 SECTION 3. There is appropriated out of the general
4 revenues of the State of Hawaii the sum of \$ or so
5 much thereof as may be necessary for fiscal year 2007-2008 for
6 the University of Hawaii center for conservation research and
7 training during phase 1 to develop the best strategies
8 consistent with comprehensive agricultural management practices
9 to facilitate sustainable production of crops through long-term
10 enhancement of soil quality using ecologically-responsible
11 means.

12 SECTION 4. There is appropriated out of the general
13 revenues of the State of Hawaii the sum of \$ or so
14 much thereof as may be necessary for fiscal year 2008-2009 for
15 the University of Hawaii center for conservation research and
16 training to implement phase 2 and identify and solicit federal
17 and other funding to coordinate implementation and ecological
18 monitoring of a pilot demonstration project of the dual-purpose
19 soil additive and energy production facility developed during
20 the phase 1 research and development.



1 SECTION 5. The sums appropriated shall be expended by the
2 University of Hawaii center for conservation research and
3 training for the purposes of this Act.

4 SECTION 6. This Act shall take effect on July 1, 2007.



Report Title:

Integrated Strategies for Statewide Food and Energy Crop
Production

Description:

Appropriates funds for the Center for Conservation Research and Training at UH to develop best practices consistent with comprehensive agricultural management strategies to facilitate sustainable production of crops through long-term enhancement of soil quality using ecologically responsible means. Implements a pilot project demonstrating integrated strategies to enhance soil fertility for the production of clean energy feedstocks (agricultural crops used as the raw materials for biofuels or biomass-to-electricity production) and food crops. Establishes mechanisms by which stakeholders can work collaboratively in the development of best practices and to educate the public about sustainable agriculture issues faced by the state. (SD1)

