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October 1, 2024

The Honorable Ronald D. Kouchi,
President, and Members of the Senate
Thirty-Second State Legislature
State Capitol, Room 409
Honolulu, Hawai'i 96813

The Honorable Scott K. Saiki, Speaker,
and Members of the House of
Representatives
Thirty-Second State Legislature
State Capitol, Room 431
Honolulu, Hawai'i 96813

Dear Senate President Kouchi, Speaker Saiki, and Members of the Legislature:

For your information and consideration, I am transmitting a copy of the Hawai'i Hemp Task Force Report required by Act 263, SLH 2023.

In accordance with Section 93-16, Hawai'i Revised Statutes, I am also informing you that the report may be viewed electronically at <https://hdoa.hawaii.gov/meetings-reports/legislative-reports/>.

Sincerely,

Sharon Hurd
Chairperson, Board of Agriculture

Attachment



Hawaii Hemp Industry Infrastructure Report



Submitted to the Hawaii State Legislature
by
The Hawaii Hemp Task Force
August 30, 2024



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Members of the Hawaii Hemp Task Force, were comprised of representatives from Kauai, Oahu, Molokai, Maui, and Hawaii Island representing the fiber and building materials, fuel, food and animal feed, and cannabinoid sectors of the Hawaii hemp industry: Brittany Neal, Gail Byrne Baber (Chair), Gloria Ilagan, Grant Overton, Greg Smith, Janine Holstein, Jared Dlagamouni, Joseph Smith, Judiah McRoberts, Kelly King, Kyle Leong, Lilianna Napoleon, Michele Matsuda, Qing Li, Robert Bence, Scotty Wong, Ty Cheng, Rusty Tapp.

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- Hawaii Department of Health: Gregory Edwards and Liam Gimon,
- Consultants hired by the Department of Agriculture: Char O’Brien and Megan Villa,
- Key sponsors and supporters of hemp legislation: Senator Mike Gabbard, Representative Dee Morikawa, Representative Cedric Gates, and Senator Tim Richards.

I. Summary

Of all crops, worldwide, hemp has the most uses across the most industries with 52,000 end-uses including food, fiber (building materials, textiles, paper), animal feed, cannabinoids, and, importantly, a renewable source of fuel. Hemp could easily be part of the solution to Hawaii’s housing crisis, uniquely offering an opportunity for Hawaii farmers to grow and, with minimal processing, offer building materials that are fire, mold, and termite resistant and renewable – three to five crops per year can be grown in Hawaii. There are hemp building materials and housing projects in the works in Hawaii on four islands. Hemp can become a leader in sustainable building that sequesters carbon while creating numerous new jobs. As explained in this report, Hawaii can move the dial on agriculture quickly as a soil remediator and accelerator of scaled, mechanized food production. Significantly, residents already spend \$54 million on hemp cannabinoid products per 2020 estimates, but these products are mostly imports that don’t meet Hawaii regulations or standards¹. With minimal marketing support and allowing farmers and Hawaii businesses to produce the products residents want, it is likely Hawaii farmers could capture 25% of this large existing in-state market so that at least \$16 million that now goes to mainland farmers and business will stay in Hawaii; which is not representative of the total addressable national U.S. market for cannabinoids of \$28 billion that Hawaii farmers could participate in.² Notably, a great deal of work has been completed in the state on using hemp for renewable energy: research is completed, infrastructure is in place or identified, suitable hemp varieties have been selected. Hemp can replace a large portion of our imported

fuels. The Hawaii Electric Company is currently planning on replacing approximately 12.4% of the state's electrical needs with renewable hemp-based energy sources instead of fossil fuels³.

As outlined below, Hawaii was a pioneer in the modern hemp era for almost three decades. But due to regulatory flux and excessive regulations, Hawaii's hemp farmers and businesses have suffered significant financial losses (many went out of business) and investment in all the hemp sectors (fuel, fiber, building materials, food, feed, and cannabinoids) has been lost and stymied. This report offers findings from the members of Hawaii's hemp industry regarding the current state and needs of the industry as well as recommendations to allow the industry to become the sustainable economic engine it can be sooner rather than later.

For 35 years, Hawaii has helped pioneer the modern hemp era in the United States (U.S.). In 1990, as more sugar cane companies were closing, Hawaii hemp farmers founded the Hawaii Hemp Council to support moving the islands towards greater sustainability. The farmers urged replacing sugar with a crop that could provide food, fuel, and fiber for building materials. In 1999, Hawai'i became the first U.S. state to legally cultivate hemp since the 1937 prohibition. Under the leadership of Rep. Cynthia Thielen and support from then Governor Cayetano, the Hawaii State Legislature passed House Bill 32 to allow research on hemp. Between 1999 and 2014, hemp bills were introduced regularly by Representative Cynthia Thielen and Senator Michael Gabbard. A second Hawaii farmer lead initiative between 2013 to 2016, again with support from Thielen and Gabbard, resulted in two more hemp bills establishing a research project at the University of Hawaii and a pilot project to allow farmers to conduct research as allowed under the 2014 U.S. Farm Bill, which made Hawaii one of the first states to support a pilot project legislatively. However, the gains of being pioneers in the industry were quickly lost for reasons outlined in Section III, Key Findings, Hawaii hemp farmers and businesses have faced significant hurdles including, excessive regulation and regulatory flux, while being overrun by illegal imported hemp products. All of this has undermined investment into the industry and rendered Hawaii's hemp farmers and businesses non-competitive as well as resulting in significant financial losses for farmers. Despite these obstacles the young industry has enormous potential to move Hawaii towards true sustainability. Globally, investors are eyeing the hemp industry for its green potential, which they know consumers are demanding, with the U.S. hemp industry projected to reach \$47.82 billion by 2032 for fiber, fuel, food, animal feed (non-cannabinoid sectors) and \$202.45 billion for cannabinoid.^{4,5} Hemp can significantly move the dial on food security in Hawaii and the time is now to support an emerging home-grown building industry to meet Hawaii's immediate housing and rebuilding needs, which will grow many offshoot businesses.

II. Purpose

This report outlines the key findings and recommendations of the Hawaii Hemp Task Force and consultants hired by the Department of Agriculture. The task force and report are required to

be delivered to the Hawaii State Legislature per Act 263, which passed in 2023.

Per Act 263: "...identify the infrastructure needs of Hawai'i hemp farmers and the hemp industry, considering the unique needs and geographic spread of Hawaii's licensed hemp farmers and the various hemp sector needs."

The soft and hard infrastructure needs of the Hawaii hemp industry are included in this report. Soft infrastructure refers to technical assistance, marketing, education and outreach, regulatory, funding, research, etc., while hard infrastructure refers to materials, equipment, and facilities.

III. Key Findings and Recommendations

A. All Sectors: Fiber and Building Materials, Fuel, Food and Animal Feed, Cultivar Research, and Cannabinoids

1. Findings and Recommendations All Sectors

The below findings apply to all sectors within the hemp industry.

No other crop offers the diversity of economic opportunity for Hawaii that simultaneously moves Hawaii towards a sustainable, more closed-loop economy where more of our residents' hard earned money stays in the islands. The Hawaii hemp industry can revitalize the state's economy and create numerous sustainable green businesses and products including:

- fiber for textiles and building materials (prefabricated, hemp blocks, insulation and wood replacements),
- renewable bio diesel and renewable natural gas (RNG) to replace imported fuels,
- food from hemp seeds, including high-end health products,
- full spectrum and cannabinoid (CBD) products.

Several of these hemp industry sectors are active in Hawaii and all of them are being pursued by Hawaii businesses and organizations. This is not pie in the sky dreaming, but there is work to be done and the Legislature and state agencies have an important and timely role to play.

Hemp can significantly move the dial for Hawaii agriculture by:

- Remediating and regenerating agricultural lands that have been polluted through phytoremediation, which is the uptake of pollutants into plant tissue and/or conversion of pollutants facilitated by hemp by supporting unique microbial activity. Research by the University of Hawaii confirmed hemp's ability for phytoremediation for Hawaii's unique conditions in 2015.
- Regenerating soils that are depleted of nutrients and organic matter. Hemp is an excellent rotational crop that can enhance the production of other food crops.

- Accelerating the move towards greater mechanization of large-scale food production. The quantity of hemp required for sustainable and viable building materials, biofuel and biomass industries necessitates that machinery and large-scale growing techniques will need to be employed. The accelerated adoption of the cultivation of hemp will support mass scale production of more food.
- Providing high quality, locally grown animal feed.
- Offering value-added product opportunities for farmers that offset food production costs and provide greater financial stability, especially for small family farms. Hawaii farmers have some of the highest costs of production in the world and what the consumers are willing to pay for food doesn't cover costs. Hemp products, especially cannabinoid products, that can be processed and manufactured on-farm in boutique quantities, offer the margins that farmers need, especially small farms that comprise nearly 70% of Hawaii's farms. Hawaii residents spend \$52 million per year on hemp cannabinoid products, most of which are imports. Capturing just 25% of this established market for Hawaii farmers is what Hawaii agriculture needs.
- Providing a highly sustainable, local source of protein for humans with a strong nutrient profile. Hemp seeds are recognized by the U.S. Food and Drug Administration as safe for consumption and are available for sale throughout Hawaii and are in many health food products.

Hemp is a cornerstone to expanding food production and meeting Hawaii's food security goals through the use of large-scale cultivation technologies and equipment as well as providing a locally grown source of animal feed, green material and compost to regenerate soils, phytoremediation of polluted soils, and rotational crops to support food crop cultivation.

Hawaii has an affordable housing crisis, highlighted, and compounded by the recent wildfires in Lahaina and upcountry Maui. The Maui County Council estimated in 2016 that it needed to build 14,000 housing units over the next decades to keep up with demand and now due to the wildfires in August 2023, that burned over 2000 businesses and residences, the situation is more dire. It is very possible that Hawaii could quickly establish a hemp building industry that is home grown and sustainable, while creating economic opportunities. Hemp building materials are mold, termite, and fire resistant.

Hawaii is well positioned for investment into the hemp industry with our ability to grow hemp year-round and because of the value of Hawaii branding, assuming the challenges the Hawaii industry faces are solved. The U.S. hemp industry is anticipated to reach \$6.2 billion by 2030 for all sectors, food, fiber, fuel, full spectrum and cannabinoid products and global investors are eyeing hemp as a green option to meet consumer demands for various products marketed as sustainable.

With the loss of over 700 farms and 82,000 acres of agriculture land in five years per the last

U.S. Department of Agriculture census, hemp is uniquely poised, to help Hawaii agriculture make a quantum leap towards greater viability while moving the islands towards greater sustainability.

However, the industry has been hamstrung by regulatory flux and excessive regulations that have stymied investment, rendered Hawaii farmers non-competitive, and resulted in significant losses by Hawaii hemp farmers and businesses.

- a. **Regulatory Flux** means a continual changing regulatory environment or threat of change from new bills introduced every year to the legislature that would change the regulatory landscape for farmers and the industry. This flux has undermined investment into Hawaii hemp businesses, including the withdrawal of committed funds as new regulations were introduced. The number of farmers taking a break from planting hemp until there is more stability is evidenced by the drop in the number of USDA issued hemp licenses and the small number of hemp processing applications.
- b. **Excessive Regulations**, at times the toughest in the U.S., have rendered Hawaii farmers and hemp businesses non-competitive and resulted in large financial losses. Examples include, preventing hemp farmers from purchasing hemp seeds from other mainland U.S. farmers, which required expensive sourcing of seed from Asia and other parts of the world, setting farmers substantially behind their mainland peers; significant delays in drafting and issuing rules – it took two years for rules to be drafted after the Legislature approved a hemp pilot program, which eliminated Hawaii as an emerging pioneer in the hemp industry and resulted in farmers missing key timing for entering the market; not allowing farmers to move hemp off their farm, which made processing and participating in the market place to recoup costs nearly impossible; establishing buffers that made it 1.) impossible for many small farms to grow hemp and 2.) difficult to process hemp in some existing facilities available to other agricultural sectors; costly security requirements that no other state required; more stringent crop testing requirements that no other state had for at least three years which meant Hawaii farmers had much less leeway for ensuring their crop had acceptable compounds compared to all the other states, resulting in more crops that had to be destroyed compared to mainland farmers and significant financial losses; product testing requirements that are equivalent to those required for medical products, although the industry has embraced these higher costs to prove the superior quality of Hawaii hemp products the playing field is not even as the huge number of imports don't have these production costs; 2024 proposed rules for full spectrum hemp and cannabinoid products that would render Hawaii farmers and manufacturers unable to compete with the flood of illegal imports in Hawaii and removing currently legal products farmers have been making for years; etc.

- c. **Restricted Access to Banking and Loss of Insurance** has impacted basic business functions for farmers and hemp businesses. Local banks and credit unions were at first reluctant to open accounts for hemp businesses. The exception seems to be for a hemp farmer who had a contract from the state to do seed research and faced few hurdles in opening an account after presenting the contract with the state. Credit unions, who were some of the first to allow banking for hemp businesses, often lack the ability to easily receive funds from overseas, limiting or hampering investment opportunities. The 2019 Secure and Fair Enforcement Banking Act (SAFE) provided protections for financial institutions that service hemp businesses. However, although the compliance departments of Hawaii banks are likely aware of the provisions of the SAFE Act, often banks are slow to revise their internal control processes so members of the Hawaii hemp industry have had their accounts frozen and cancelled unnecessarily. Insurance companies have dropped hemp businesses in the last few years as states move to combine hemp with marijuana in the same regulatory structure in some states.

A poignant example of the loss of investment in Hawaii hemp industry due to regulatory flux and excessive regulations was provided by leading hemp and cannabis economist Beau Whitney (<https://whitneyeconomics.com>) in a July 2024 email to consultants hired by the Department of Agriculture⁶:

"I think the fact that I was trying to drive a project that would net Hawaii farmers \$200 million in revenue, yet because of the anti-hemp legislation I chose to go to a different state, would be telling enough...."

I recently spoke at a conference in London on cannabis, including hemp. There was an expert from an investment firm that also spoke. He stated that when there is uncertainty and the lack of potential returns, in any market, investors will not take the risk. This is what is occurring in hemp and is exactly happening in Hawaii. Without investment, there is no market. That is the choice the policy makers there are making.

*If Hawaii is truly committed to hemp, then they would approve more pro-hemp policies for the state. If they did, I would bring my \$200 million project back to Hawaii. **As it is now, investors will not touch the state (Hawaii) with a 10-foot pole.** A low THC policy is but one of many absurd policies that is negatively impacting the industry there and, as a result, is impacting employment, taxes and opportunities for the agricultural community.*

From my perspective, as a hemp bioplastic manufacturer as well as an economist, the legislature has killed the hemp market in Hawaii. Hawaii, as I laid out in my economic impact analysis years ago, has the opportunity to expand hemp and support economic development in the state. Yet with its current set of policies, it is ceding the market to

not only other states, but other countries and this is having a negative economic impact on the hemp, agricultural, and overall state economy.”

Hemp also faces the same challenges of most agriculture in Hawaii – affordable labor.

And hemp has the unique challenge of securing hemp seed and cuttings that are well suited for Hawaii’s photoperiods (daylight hours) and climates. Seed varieties often have intellectual property rights associated with them, which limits farmers’ and the industry’s ability to adapt seed to Hawaii’s conditions.

Finally, state funding is required to move the industry forward. This recognizes the industry has suffered tremendous financial losses because of regulatory flux and excessive regulations that have also greatly hampered Hawaii’s hemp industry development.

2. Recommendations All Sectors: Fiber and Building Materials, Fuel, Food and Animal Feed, Cultivar Research, and Cannabinoids

The below findings apply to all sectors within the hemp industry: fiber, fuel, food, animal feed, cultivar research, and cannabinoid.

- a. Align Hawaii regulations with Federal law, and never exceed it. This is needed to have a stable and investable industry in Hawaii. Simply, no legislation ever shall be introduced that redefines hemp or limits its cultivation, processing, or manufacturing of products or limits its end uses. To comply with Federal law, the biofuel and biomass sector requires that the state allow the use of the whole plant, including leaves, to align Hawaii with Federal regulations, see page 21. The cannabinoid sector is calling for a stop to all legislation that would be disruptive to that sector with regard to processing and manufacturing, see page 32.
- b. To encourage investment and dispel Hawaii’s reputation for discouraging innovation, an official memorandum should be issued by the Attorney General’s Office affirming the legality of hemp in Hawaii to landowners, financial institutions including mortgage companies, insurance companies, and all of Hawaii’s County Mayors to be shared with all County departments. The following shall also be in the letter:
 - o The state’s commitment not to exceed Federal hemp laws and rules should be confirmed in the letter.
 - o A reminder that financial institutions may need to update their internal operating procedures and controls to reflect the federal 2019 Secure and Fair Enforcement Banking Act (SAFE) to stop discriminating against hemp businesses and farms and ensure business services are not interrupted or discontinued.

The memorandum shall be posted publicly on the Department of Agriculture and Department of Health’s websites.

- c. Pass legislation that directs financial institutions not to discriminate against hemp farms and businesses.
- d. Request that the Hawaii Insurance Division require all insurance companies doing business in the state of Hawaii to offer hemp farmers and hemp processors the same coverage options for the same prices as other crops.
- e. Permanently exclude hemp from any future “Cannabis Regulatory Agency” or similar proposed agency as was proposed during the 2024 Legislative session per the recreational cannabis bill, SB 3335.
- f. If sub-classifying industrial uses for exclusions from Hawaii Department of Health regulations, hemp shall include hemp production for all uses other than cannabinoids, including but not limited to production for seed, biomass and biofuels, fiber, animal feed, and food.
- g. Eliminate all buffers for cultivation and processing, except for schools and hospitals.
- h. Eliminate transportation reporting requirements for hemp.
- i. The Department of Agriculture should develop and approve Performance Based Sampling Protocols with hemp farmers. This is already an accepted path by the US Department of Agriculture to exempt certain hemp crops, such as grain or microgreens, from the testing requirements if certain protocols such as the use of the same certified seeds that can show that the crop is not going to test above federal limits so therefore no USDA lab test before harvesting is required.
- j. Support seed breeding to develop an adequate supply and range of hemp seed varieties that can thrive in Hawaii’s unique micro-climates and photoperiods. The seed needs vary by sector (Fiber, Fuel, Food, Animal Feed, Cannabinoids) and an adequate supply of seed for each sector is required to significantly advance Hawaii’s hemp industry and create a more closed loop economy. Ensure publicly supported seed breeding programs or those undertaken by the University of Hawaii result in unrestricted and “open source” seeds, meaning farmers and businesses do not have to pay royalties for using the seed for their own breeding purposes.
- k. Support applied research collaborations between Hawaii educational institutions and farmers, processors, and manufacturers. This can accelerate the transfer of knowledge into the industry.
- l. Provide no interest loans for non-immigrant labor with H-2A work visas that is secured by an employer and the loan is repaid out of paychecks. Often labor arrives in Hawaii without

enough money for basic necessities.

- m. Offer grants for three years to offset labor costs for hiring residents.
- n. Support work force development for labor required for the hemp industry. Give weight to organizations providing certifications that are transferable.
- o. To accelerate the development of the Hawaii hemp industry after years of losses due to regulatory flux and excessive state regulations and rules, the Hemp Task Force recommends the state incentivize all sectors of the hemp industry, ensuring that all sectors are offered the supporting consideration and that a group representative of all sectors in the hemp industry represented proportionately by island by the number of USDA hemp licenses be convened to meet and determine the best methods to support each sector. If this group cannot be convened then grants and other forms of support for all sectors be made available through a competitive and transparent process that are weighted to support local, Hawaii farmers and Hawaii based companies.
- p. Hire one full time employee (FTE) for the Department of Agriculture and one full time employee for the Department of Health. These two FTEs shall act as Hemp Coordinators and the intermediary between hemp producers and the relevant state agency and shall hold monthly meetings to allow for ongoing dialog and to answer any questions about hemp rules and regulations and policies. The job duties of these two Hemp Coordinators shall be only related to industrial hemp and shall not be transferrable to other areas within the relevant departments where there are personnel shortages. Responsibilities for the two FTEs are outlined below.
 - p.1. The Department of Agriculture FTE shall be devoted to providing technical assistance and furthering the public's interest in a robust hemp industry. Job duties will not be regulatory but focus on providing technical assistance; similar to the approach that the Natural Resource and Conservation Service takes. Responsibilities would include,
 - o Technical Assistance - Providing guidance and technical support to hemp farms and businesses on best practices, regulatory requirements, and industry standards. This could involve helping with the implementation of new technologies or methods. Identifying funding and strategic partnership opportunities and communicating those opportunities to the industry. Facilitating open and transparent communication within the industry between farmers, processors, manufacturers, researchers and state agencies. Elevating and communicating industry needs to state agencies and the Governor's office.
 - o Education and Training - Organizing and delivering training sessions or workshops for industry stakeholders to share and learn about best practices with one another and experts outside Hawaii. Staying abreast of the latest advances in cultivation, processing, and manufacturing in the various sectors,

- Policy Development – Working collaboratively and openly with stakeholders, periodically reviewing and identifying necessary updates, including recommendations in this report. Assisting in the development and updating of state policies and regulations related to the hemp industry.
- Research and Analysis – Distribute for optimal transfer of knowledge research on emerging trends, technologies, and scientific developments related to hemp, especially activities within Hawaii.
- Reporting – working with hemp industry members to review and update this report bi-annually, as needed.

These duties likely require a blend of technical knowledge, strong communication skills, and relationship building skills to effectively support the hemp industry at the state level.

p.2. The Department of Health FTE shall provide technical assistance to cannabinoid hemp processors and manufacturers including,

- Technical Assistance - provide guidance and technical support to hemp farms and businesses on best practices, regulatory requirements, and industry for processing and manufacturing and communicating those opportunities to the industry. Facilitating open and transparent communication within the industry between farmers, processors, manufacturers, researchers and state agencies. Elevating and communicating industry needs to state agencies and the Governor’s office.
- Compliance Support – help manufacturers and processors understand how to comply with state rules and offer best practice templates or outlines of standard operating procedures to facilitate compliance. Provide bi-monthly call-in office hours for industry members to ask questions and learn from one another.
- Education and Outreach – disseminate simple, concise information and service announcements to retailers about cannabinoid labeling and testing requirements and age restrictions for edibles and beverages that require a retailer to ask customers to show proof of age through a state identification card, driver’s license, passport, or similar government document. This position should not be used to create a registry of cannabinoid retailers, nor should retailers be required to acquire any special licensing or permits to sell cannabinoid products. Launch a 12-month educational campaign composed of public service announcements via radio and social and print media that educate the public and retailers on age restrictions and carding for cannabinoid food and beverage as well as encouraging residents to review labels to identify compound concentrations and the source of the hemp. The objectives of the campaign include providing information to consumers and retailers so they can easily determine what a compliant product is, understand state identification is required to purchase food and beverage cannabinoid products and to help consumers be able to make informed choices about origin labeling so, if they choose to, they know how to support locally grown hemp products.

- q. Continue bi-annual meetings of the Hawaii hemp task force to update and recommend changes to this report and review progress of implementation.

Nothing in the current state hemp regulations or proposed in these recommendations of this report for any sector relieves farmers, processors, or manufacturers of complying with state pesticide and herbicide laws.

B. Fiber and Building Materials

1. Findings

Fiber

Hemp fiber, derived from the stalks of the hemp plant, is a versatile and eco-friendly material with a myriad of applications including, textiles, paper, building materials, bioplastics, composite panels for cars, rope, mulch, and animal bedding. Some of these products require minimal processing and can be used straight out of a decorticator and some require need additional processing. Once additional infrastructure in addition to decortication is in place to process these types of products, Hawaii can lessen its reliance on many imported goods that can be made from hemp fiber and create new industries in the state. Below are some of the products and benefits of replacing traditional products with hemp alternatives.

- o *Building Materials* - Construction materials currently being produced from hemp hurd or fiber:
 - Hempcrete
 - Hemp blocks
 - Hemp/cement structural blocks
 - Insulation
 - Hempwood panels
 - Fiber board
 - Sub-flooring

The benefit of a home-grown building materials supply is that Hawaii agriculture can focus on producing the raw materials continuously for Hawaiian industries rather than a one-time export.

- o *Hemp Paper* - Environmental Impact: Hemp grows much faster than trees, maturing in just 3 months compared to 20-80 years for trees. This rapid growth rate means hemp can be harvested and replanted multiple times a year, leading to a sustainable supply of raw material. Producing paper from hemp requires fewer chemicals than from wood pulp, reducing environmental pollution. Hemp paper is more durable and resistant to decomposition. It can be recycled more times than wood-based paper. Additional processing and equipment after decortication is needed to make hemp paper.

- *Hemp Animal Bedding* - Hemp bedding is soft and comfortable for animals. It is also dust-free, reducing respiratory problems. Its natural absorbency helps keep animal enclosures dry and odor-free, enhancing the living conditions for pets and livestock. Hemp bedding is biodegradable and compostable. Bedding, when used in a free-range poultry setting, can absorb manure that can be further processed in Black Soldier Fly larvae to be used as poultry or fish food.
- *Hemp Textiles* - Hemp requires less water and fewer pesticides than cotton to grow. This makes hemp a more sustainable choice for textile production. Hemp fibers are stronger and more durable than cotton, leading to longer-lasting clothing and fabrics. Hemp textiles are breathable and become softer with each wash, offering comfort comparable to cotton. Additional processing and equipment is needed to make hemp textiles.
- *Bioplastics* - Hemp-based plastics are biodegradable, unlike conventional petroleum-based plastics, which persist in the environment for hundreds of years. Hemp plastics are strong, durable, and lightweight, making them suitable for various applications, including utensils, packaging, automotive parts, and construction materials. Producing hemp plastics emits fewer greenhouse gases than traditional plastic production, contributing to a lower carbon footprint. Additional processing and equipment are needed to make hemp bioplastics.
- *Hemp Rope* - Hemp rope is stronger and more durable than cotton rope. It resists rotting and degradation from UV light better than cotton. Hemp cultivation is more sustainable, requiring fewer resources and having a lower environmental impact than cotton farming. Hemp rope is versatile and can be used in various applications, from maritime activities to crafting and home use. Additional processing and equipment are needed to make hemp rope.

Building Materials

Hawaii has an affordable housing crisis, highlighted, and compounded by the recent wildfires in Lahaina and upcountry Maui. The Maui County Council estimated in 2016 that it needed to build 14,000 housing units over the next decades to keep up with demand and now due to the wildfires in August 2023, that burned over 2000 businesses and residences, the situation is more dire.

Preliminary calculations indicate that the hemp biomass from 4800 acres could build and insulate about 1,650 houses per year from nearly 100% locally grown and processed materials. It is often less expensive to build with hempcrete while greatly reducing the heating and cooling costs of a house which represents 42% of the lifetime carbon impact. Leaving the potential for housing developers to earn carbon credits just by building ecologically sound houses.

Using a variety of hemp materials and building techniques could accelerate home building: hempcrete blocks, prefab hempcrete panels, 3D printing hempcrete building, spray

hempcrete. These building methods and hemp materials are currently in production on the U.S. mainland or in other countries.

There are several projects across the islands that are working on developing a building supply chain for hempcrete as well as building with hemp building materials. Two of these projects are working to develop affordable housing projects. Most of them are in the pilot or start-up phase, trialing hemp varieties, securing land, identifying technology needs, and working to secure funding and investment.

A Maui based company recently completed their second hempcrete home on Maui. Since launching their hempcrete focused business this year, there has been local interest in building with hempcrete. However, the hemp hurd for the hempcrete still needs to be imported which is an added expense and carbon footprint.

Below are some reasons why building homes with hemp grown in Hawaii would be beneficial:

- *Sustainable Material:* Hempcrete is made from the inner woody fibers of the Industrial Hemp plant mixed with lime and water. The hemp hurd used for hempcrete comes straight out of the decorticator with no additional processing needed. It's a renewable resource that grows quickly and requires minimal water and can be grown without pesticides. Using hempcrete can contribute to sustainable rebuilding efforts and reduce the environmental impact of construction.
- *Fire, Mold, and Termite Resistance:* Some of the key benefits of hempcrete are its fire, mold, and termite resistant properties. While it's not fireproof, hempcrete is significantly more fire-resistant than traditional building materials like wood. This could be particularly beneficial in areas prone to wildfires, such as the dryer areas of the islands, helping to mitigate the risk of future fire damage.
- *Insulation:* Hempcrete provides excellent insulation properties, regulating temperature and humidity within buildings. In a tropical climate like Hawaii, proper insulation is crucial for maintaining comfortable indoor conditions without relying heavily on energy-intensive cooling systems. Additionally, hempcrete's breathability can help prevent mold and mildew growth, which is important in humid environments.
- *Carbon Sequestration:* Hempcrete has the ability to sequester carbon dioxide from the atmosphere during its production, making it a carbon-negative building material. By using hempcrete in construction projects, it's possible to offset carbon emissions, contributing to efforts to combat climate change.
- *Local Economic Development:* Hemp cultivation and hempcrete production can create economic opportunities for local communities. By establishing hemp farming and

processing facilities in Hawaii, it would create jobs and support the local economy while also providing a sustainable building material for reconstruction efforts.

- *Regenerative Agriculture*: Hemp cultivation can improve soil health and biodiversity, as it requires minimal inputs and can be grown in rotation with other crops, assuming certified organic or other regenerative and natural practices are used. In areas affected by wildfires, regenerative agricultural practices can help restore damaged ecosystems and mitigate the risk of future wildfires.
- *Renewable Resource*: Due to Hawaii's climate, there is potential to harvest hemp year around, thereby creating a continuous supply of hemp to build homes with. Utilizing hemp as a rotation crop for smaller farmers can add to the supply chain as well.

Conclusion

The convergence of extreme housing needs throughout Hawaii, including the rebuilding of Lahaina, with the opportunity to grow a significant amount of the building materials we need is the best time (now) to launch a sustainable fiber and building materials sector with the Hawaii grown hemp that will create numerous jobs and entrepreneurial opportunities.

Hempcrete offers numerous environmental and practical benefits including resistance to fire, termites, and mold. The hemp hurd used to make hempcrete comes straight out of the decorticator and does not need any additional processing.

In the last five years, several hemp homes have been constructed in Hawaii and there are several projects around the state (Kauai, Oahu, Maui, Hawaii Island) planning to scale their fiber hemp production for building materials for housing, including affordable housing projects. Hawaii has contractors, builders, and architects experienced with hemp construction.

The limiting factors for quickly launching this sustainable building materials industry is lack of fiber processing facilities, which can also support the numerous other businesses such as soil amendments, mulch, all-natural absorbent/clean up material for spills, etc. A secondary challenge is the need to prove hemp fiber grows at scale – hundreds to thousands of acres. The Task Force has confirmed interest for fiber - over the last six years, Hawaii hemp farmers have often received calls from local entrepreneurs who would like their decorticated materials to incorporate into products.

Replacing traditional products with hemp fiber-based alternatives can lead to significant environmental and economic benefits for the islands. Hemp's rapid growth, low resource requirements, and biodegradability make it an excellent sustainable choice for a wide range of applications.

Because a number of these products like paper, textiles, and bioplastics need additional processing, the initial fiber focus should be on hemp hurd for hempcrete and other products that can come straight out of the decorticator and require no additional processing. Once Hawaii is able to build its fiber processing plants and is farming hemp at scale, secondary processing for additional products can be added.

2. Recommendations - Fiber and Building Materials Sector

- a. Create a dual funding pathway for fiber processing facilities by establishing,
 1. At least four large-scale facilities around the state to jump start the products required for mass building that includes hemp hurd for hempcrete and possibly other hemp building materials, and,
 2. Numerous small decorticators/fiber processors that are based on individual farms or in shared agricultural facilities.

The Hemp Task Force recommends the state incentivize all sectors of the hemp industry, ensuring that all sectors are offered the supporting consideration and that a group representative of all sectors in the hemp industry represented proportionately by island by the number of USDA hemp licenses be convened to meet and determine the best methods to support each sector. If this group cannot be convened then grants and other forms of support for all sectors be made available through a competitive and transparent process that are weighted to support local, Hawaii farmers and Hawaii based companies.

- b. Subsidize the cultivation of hemp for farmers to ensure the processors have adequate supply at \$300/ton of biomass and \$0.40/lb for seeds.
- c. The state Building Code Council of the Department of Accounting and General Services should update its codes and send a letter to all Hawaii counties asking them to update their building codes to include the 2024 Appendix BL Hemp-Lime (Hempcrete) Construction of the International Residential Code (IRC).
- d. The state Building Code Council of the Department of Accounting and General Services or other appropriate agency shall add hemp and hemp building materials to its definitions of Green Materials per Hawaii Code R. § 15-217-59.
- e. The state Department of Taxation shall offer a green building tax credit for buildings and homes where the primary structure is built with a significant portion of hemp – at least 30% of the materials. The credit shall be on par with the 35% tax credit offered for renewable energy systems.
- f. Convene a subcommittee of the Hawaii Hemp Task Force to oversee the building materials recommendations and facilitate speedy implementation.

- g. The state should include hemp and hemp building materials in their building projects and require that any contracted building includes in the request for proposals weighted criteria to support the adoption and use of Hawaii grown hemp building materials.
- h. State agencies and county departments working on climate change and carbon sequestration technologies should include hemp building materials to achieve their goals and objectives.

C. Fuel and Biomass Sector

1. Findings

Hemp for biofuel production is a very promising renewable energy source that can support Hawaii's goal of energy autonomy. Hemp offers a sustainable solution to meet escalating energy demands, while reducing both carbon emissions and Hawaii's dependency on imported fossil fuels. The findings and challenges associated with hemp biofuel production follow, focusing on two primary processes: biodiesel from hemp seeds and RNG (Renewable Natural Gas) from hemp biomass.

However, the biofuel and biomass sector has been significantly hampered by Hawaii state regulatory flux, which deters investment. Regulations, exceeding Federal law and those of other states, have impacted the feasibility and practicality of research.

a. Biodiesel Production from Hemp Seed Oil

Biodiesel is produced by pressing hemp seeds to extract the seed oil, which is then converted into biodiesel. This process has a long history, with hemp biodiesel being used to power the first cars of Henry Ford over a century ago. Seed oil crop conversion is considered one of the most straightforward commercial biofuel processes, and the necessary industrial infrastructure already exists in Hawai'i through the forward-thinking efforts of a Maui-based company. Hemp has been shown to provide biodiesel yields of around 83 gallons/acre, providing higher yields than soybean, the most widely grown biodiesel crop in the United States.

The Maui-based biodiesel company, currently produces over 6,000,000 gallons of biodiesel per year for the local Hawaii market. The company opened and operated one of the first biodiesel plants, as well as the first retail biodiesel pump, in the US. They began nearly 30 years ago making biodiesel from recycled cooking oil on Maui and later expanded into using grease trap waste and animal renderings. More recently, this company has been growing sunflowers and safflowers to demonstrate the island's potential for growing oil seed crops to reduce Hawai'i's dependence on imported fossil fuels. The company employs over 100 people in meaningful jobs.

The Maui-based business attempted to experiment with growing hemp seeds for biodiesel production, after securing one of the first licenses to produce hemp in Hawaii. However, political and social stigma associated with the confusion between Industrial Hemp and cannabis created significant barriers. According to the Vice President of the Maui company, no local bank was willing to fund hemp biodiesel projects due to fears of public backlash. As a result, the company's founders had to create a business entity in their personal names to proceed with experimentation. Unnecessarily restrictive and costly security measures required by the state in addition to restrictions on crop movement, greatly curtailed their research. These measures were not required by other hemp pilot programs in other states.

The Maui-based company also has a large processing plant on the Big Island that is capable of producing both hemp seed culinary oils for food consumption and hemp-derived biodiesel, similar to the company's current processing of macadamia nut waste and purpose-grown sunflower and safflower oil seeds. When industrial hemp production begins at scale in Hawaii, this existing infrastructure can be used for hemp seed oil processing.

b. RNG Production from Hemp Biomass

Anaerobic digestion is a process where natural microorganisms break down organic materials, like food waste or agricultural biomass, in the absence of oxygen, producing biogas. This biogas can be cleaned and converted into RNG (renewable natural gas), which can be used as a sustainable, drop-in replacement for natural gas. Anaerobic digestion is a commercially mature technology, widely used across Europe and North America. Hemp biomass can be readily utilized as a feedstock for RNG production and holds significant potential for the biofuels industry in Hawaii.

An Oahu-based startup company, is working to advance hemp-based RNG production with Carbon Capture Utilization and Storage (CCUS) in Hawaii, focusing on hemp cultivated under regenerative systems for food and fuel coproduction. Research by the company indicates that tropical-acclimated hemp cultivars can produce over 30 dry matter (DM) tons of biomass and 1,600 pounds of seed per acre annually. Crops are grown to full maturity to maximize both biomass and seed yield. Biomass is utilized for RNG production, while seed is prioritized for high-protein food production. As illustrated by the Maui-based company, seed oil can also be utilized for biodiesel production. Hemp biomass is comprised of roughly 60% stalk material and 40% foliage material, the later defined as the aggregate of leaves, stems, and residual floral material. Biomass composition can vary by cultivar and cultivation method.

Additional studies conducted by the Oahu-based RNG company, in part through research funded at the University of Hawaii CTAHR (College of Tropical Agricultural and Human Resources), have shown that hemp biomass is an excellent feedstock for biogas production via anaerobic digestion (AD). Key findings on RNG yields are presented below, as measured in MMBtu (Million British Thermal Unit), a unit commonly utilized in the RNG industry:

- Immature stalks, harvested without seed (silage harvesting), yield 7.65 MMBtu/ton.
- Mature stalks, harvested post-seed maturation, yield 8.94 MMBtu/ton.
- Foliage material, harvested post-seed maturation, yields 6.48 MMBtu/ton.
- Composite biomass, a mix of mature stalks and foliage, yields 7.55 MMBtu/ton.

Overall, this demonstrates annual RNG yields of around 220 MMBtu/acre, translating to over 1,600 gasoline gallon equivalents (GGE) per acre. This places hemp on par with top performing biogas crops, like silage corn and tropical energy grasses. With these promising results, the Oahu RNG company Agripelago has partnered with a publicly traded renewable energy company to potentially supply as much as 7,600,000 MMBtu/year of RNG to local renewable power plants on Oahu and Maui. The plan is envisioned to be developed in phases, starting with an initial biorefinery capable of producing around 1,000,000 MMBtu/year.

Despite this opportunity, the feasibility of using hemp for the Oahu's projects remains uncertain due to the ongoing regulatory challenges in Hawaii. This company emphasizes that the fluctuating State-level regulations have created significant hurdles, making it difficult to secure the necessary large-acreage land leases and funding needed to realize their projects. The company reports that feedback from landowners and financial institutions has been cautious, with concerns that the current State-level regulatory environment poses too much risk. One of the biggest concerns is the potential inclusion of industrial hemp in the proposed regulatory framework of the Hawaii Cannabis Authority. This could lead to unpredictable future regulations, imposed without legislative oversight or industry input, and the favoring the medical cannabis industry.

As an example of other overregulation risks, it was highlighted that foliage material comprises a vital fraction of hemp biomass that contributes around 30% of RNG yields. However, the last three State legislative sessions have proposed excessively regulating or outright excluding foliage material from the definition of industrial hemp, a move that would overstep US Federal hemp regulations. Largely this is due to unfounded concerns of de minimis cannabinoid levels in leaves, a risk that is naturally neutralized by industrial processes like RNG production. Regulating foliage material would be highly impractical and burdensome, as separating foliage material from stalks would both reduce biofuel yields and increase costs.

Plainly stated, hemp likely cannot be used as a feedstock for biofuel projects in Hawaii without regulatory clarity and certainty. As a result, this Oahu-based RNG company is actively exploring the use of alternative crops that may be less encumbered by regulatory constraints. While these alternatives could enable the company to move forward, hemp remains the preferred choice due to its dual benefits for food and fuel production. The company continues to advocate for clearer and more supportive hemp regulations in Hawaii, which would allow them to realize the potential of hemp as a key component of their RNG initiatives. According to their Cofounder and CEO, for the local hemp industry to move forward "the State must align our hemp regulations with Federal law, as described extensively under the Farm Bill and as

regulated by the USDA. We should never exceed federal regulations, now or in the future.”

Conclusion

Hemp biofuel production is a promising pathway towards achieving renewable energy goals. The sustainable nature of hemp, coupled with its high yield potential, environmental benefits, and economic opportunities, underscores its significance as a viable alternative to fossil fuels. The Maui-based company established biodiesel infrastructure and the Oahu RNG company initiatives both highlight the potential for hemp to play a key role in the transition towards a clean energy future.

However, addressing regulatory, land, and financing challenges is essential to fully realize the crop’s potential, which underscores the pressures on the broader Hawaii hemp industry. These concerns have been echoed by task force members, particularly regarding challenges with banking assistance, access to capital, and commercial insurance underwriting.

2. Recommendations Fuel and Biomass

- a. Provide regulatory certainty and eliminate regulatory flux is critical. Until this happens it will be difficult to secure investment.
- b. The state should issue a statement directed to financial institutions and insurance companies and landowners stating unequivocally that hemp is a legal crop in Hawaii and the state supports the industry to meet its sustainability goals.
- c. Hemp biomass should be defined as inclusive of both stalks and foliage material. Foliage material should be defined as the aggregate leaves, stems, and residual floral material. Foliage material should never be regulated, or excluded, from any framework used to define industrial hemp or industrial-use hemp. It is impossible to separate leaves from hemp plants and they are an important component for fuel projects.
- d. The Hemp Task Force recommends the state incentivize all sectors of the hemp industry, ensuring that all sectors are offered the supporting consideration and that a group representative of all sectors in the hemp industry represented proportionately by island by the number of USDA hemp licenses be convened to meet and determine the best methods to support each sector. If this group cannot be convened then grants and other forms of support for all sectors be made available through a competitive and transparent process that are weighted to support local, Hawaii farmers and Hawaii based companies.

D. Seed and Cultivar, Hawaii-specific Research Needs

1. Findings

a. *Background and Botanical Classification*

Hemp is typically an annual, short-day herbaceous crop that grows from seed to maturity in approximately 120 days. Harvest length is highly dependent upon cultivar and environment, with full term harvests that range from as short as 70 days to longer than 180 days. Hemp forms imperfect flowers, with males and females readily distinguishable from each other. Plants are typically dioecious, meaning they produce male and female flowers on separate plants. However, monoecious cultivars, which produce both male and female flowers on the same plant, also exist. Hemp is usually a photoperiod dependent plant, with floral induction occurring in response to the daylight interval naturally being shortened to 12 – 14 hours or fewer. Hemp produces a wide variation of distinct phenotypes and chemotypes, existing as it does today due to an ancient, coevolutionary association with humans.

b. *Current Chemotype Classification*

Hemp and Cannabis plants are currently classified into five major chemotypes (Types I to V) based on their cannabinoid profiles, influencing their use, regulation, and economic value.

1. Type I (High-THC, Low-CBD): High in THC and used for recreational and medical marijuana. Not grown under hemp programs.
2. Type II (Balanced THC/CBD): Contains relatively equal amounts of THC and CBD, primarily used medically with moderate psychoactive effects. Regulated similarly to Type I, not grown under hemp programs.
3. Type III (High-CBD, Low-THC): Dominant in CBD with low THC (typically below 0.3%). Used for CBD oil, hemp biomass, fiber, and seed products. Typically grown as Cannabinoid hemp and classified as hemp under federal law.
4. Type IV (Low-CBD, Low-THC): Typically, high in CBG, with minimal THC and CBD (both typically below 0.3%). Increasingly common for industrial-use applications, including hemp biomass, fiber, and seed products. Typically grown as Industrial-use hemp and classified as hemp under federal law.
5. Type V (Cannabinoid-Null): Contains almost no cannabinoids or contains those that are not usually measured. Rare and primarily for industrial-use applications, including hemp biomass, fiber, and seed products. Typically grown as Industrial-use hemp and classified as hemp under federal law.

While Types III, IV, and V are crucial for hemp production, most available cultivars have been developed for temperate regions, leaving Hawaii's farmers with few options that meet the specific agronomic needs of tropical climates. Please see the Comparative Summary Table on

the next page that contrasts hemp characteristics for industrial uses and cannabinoid uses.

Comparative Summary Table, Industrial-Use Hemp vs Cannabinoid Hemp

Characteristics	Industrial-Use Hemp	Cannabinoid Hemp
Plant Type and Sex	Typically Type III, IV, and V. Female and Male, with female-dominant cultivars preferred to increase seed and biomass yields. Males needed for pollination. Monoecious cultivars also used.	Typically Type III and Type IV. Female plants exclusively used to maximize flower and cannabinoid production. Males excluded to prevent pollination of flowers.
Flower Production and Presence	Not harvested for flowers, although flowers are required for seed and dual-use (biomass and seed) production.	Harvested for cannabinoid-rich flowers, often for CBD.
Cultivation Density and Cover Crop Function	Generally high density, with 100,000 – 400,000+ plants per acre. Not commonly used as a cover crop in Hawaii, but potential for integration into crop rotations.	Very low density, 1,600 to 2,000 plants/acre. Not functional as a cover crop due to plant density, but potential for integration into crop rotations. Has been successfully polycropped with food in Hawaii (integrated into food crops, growing side-by-side other food plants)
Growth Characteristics and Appearance	Tall, skinny plants resembling a silage corn or sugarcane field. Slow growth during sensitive seedling phase, then typically rapid growth.	Thicker stalks plants with larger branching canopies, typically resembling either an evenly distributed “Christmas tree” morphology or top-heavy “lollipop” morphology.
Labor Inputs and Harvesting	Typically mechanized, with lower labor requirements. Additional monitoring and maintenance required during	Often hand-harvested, with significant labor inputs and maintenance throughout. Mechanization is possible.

	seedling phase.	
Processing Methods and Product Uses	Mechanical and industrial processing, dependent upon end use. Seed for high-protein food products, seed oil for culinary products and biodiesel, biomass for biofuel, fiber, and other industrial products including textiles and building materials.	Cannabinoid extraction methods, including solvent methods (e.g., CO2 and ethanol extraction) and solventless methods (e.g., water extraction). Flower for cannabinoid and terpene products, used for supplemental and nutraceutical applications.
Seed Characteristics and Costs	Mix of female and male seeds, typically with low cannabinoid production potential. Seeds do not contain cannabinoids. Generally expensive for high quality, ideally certified, seeds suitable for Hawaii. Tropical-acclimated cultivars are required for success, which are difficult to find.	Typically feminized (100% female) seeds, with high cannabinoid production potential. Seeds do not contain cannabinoids. Generally, very expensive for high quality seeds suitable for Hawaii. Generally easier to find than industrial hemp seed. Clones (vegetative propagules) are a popular alternative to seeds.

c. *Defining Optimal Cultivars by End-use*

c.1. *Cultivars for industrial-use Hemp*

The state-of-the-art cultivars for industrial-use hemp production are TYPE IV or V dioecious cultivars with highly female-skewed sex ratios to maximize seed yield, biomass yield, and fiber quality. Male hemp plants mature faster than female hemp plants, typically forming shorter plants that form pollen structures, dehisce, and die upwards of 30 – 45 days before females are ready for harvesting. This results in difficulties harvesting, reduced seed yields, inferior fiber quality, and reduced overall biomass yields, all of which are agronomically undesirable. However, a small number of males are still required for pollination of females to solicit seed production. Leading hemp seed companies, have demonstrated that female-skewed industrial-use cultivars increase grain and fiber yields as much as 2-fold over cultivars with normal male-female sex ratios. Although advanced industrial-use cultivars exist, they often do not perform well in Hawaii’s unique environment, leading to suboptimal yields and increased challenges for local farmers.

An additional state-of-the-art option is monoecious cultivars with predominately female flower sites. Monoecious cultivars can ensure more uniform rates of pollination, seed maturation, and harvest predictability. These cultivars typically still result in lower biomass yields than female-skewed dioecious lines, but they can increase consistency and simplicity of production. Like female-skewed dioecious cultivars, monoecious cultivars are also more commonly acclimated for European climates, making them less accessible for Hawaii hemp farmers.

c.2. Cultivars for Cannabinoid Hemp

The state-of-the-art cultivars Cannabinoid hemp production are Type III or IV triploid cultivars that are feminized (nearly 100% female). Triploid hemp refers to plants with three sets of chromosomes, in contrast to regular hemp, which is diploid and has two sets of chromosomes. Tetraploid hemp, which has four sets of chromosomes, can occur naturally by random chance. By hybridizing a diploid plant with a tetraploid plant, triploid seeds are produced. This process is achieved through traditional plant breeding methods, making triploid hemp non-transgenic and non-GMO. Triploid hemp is particularly valuable to cannabinoid producers because it is sterile, meaning these cultivars are typically unable to be pollinated and unable to produce seeds. Since the goal of cannabinoid hemp producers is flower production, triploid hemp cultivars are usually exclusively female. For outdoor production in Hawaii, triploid hemp can essentially eliminate concerns of rogue pollination from nearby medical cannabis facilities and industrial hemp fields. Despite the potential of triploid cultivars to mitigate pollination concerns, there is again a significant gap in the availability of seeds that are specifically bred to thrive in Hawaii's climate.

d. Critical Photoperiod and Hawaii's Dilemma

The relatively consistent day lengths in Hawaii, ranging from about 10.5 hours in winter to 13.5 hours in summer, create challenges for cultivating photoperiod-dependent hemp. Hemp typically requires 12-14 hours of light to trigger flowering. In tropical and subtropical regions like Hawaii, where daylight hours fall very close to the critical photoperiod of hemp, temperate-climate hemp cultivars often mature too quickly and underperform. This makes it difficult for hemp cultivars, whether for industrial-uses or cannabinoids, to reach full maturity and produce financially viable yields. To overcome this, farmers can utilize one of two approaches: utilizing autoflowering cultivars or tropical photoperiodic cultivars.

Autophotoperiodism, or autoflowering, is a trait where hemp plants flower based on age rather than light cycles. Unlike photoperiod-dependent cannabis, autoflowering plants do not rely on day length. This allows for more consistent timing and the potential for multiple harvests per year, making them well-suited to Hawaii's daylight conditions. Alternatively, the critical photoperiod conundrum can be overcome by developing tropical photoperiodic hemp cultivars better suited to Hawaii's relatively consistent daylight hours. Typically, these tropical photoperiodic cultivars have much longer maturation periods, resulting in longer harvest times and larger plants.

In either case, since most hemp cultivars are designed for temperate climates in Europe and North America, cultivars must be acclimated to perform well in Hawaii. Local companies and farmers are actively engaged in developing and testing cultivars that meet suitability criteria, but the lack of readily available tropical-acclimated cultivars remains a significant challenge.

Conclusion

To ensure the long-term success of Hawaii's hemp industry, a dedicated breeding program focused on developing tropical-acclimated cultivars is essential. Such a program would address the unique challenges posed by Hawaii's consistent day lengths and the need for cultivars that can thrive in the subtropical climate. By producing hemp cultivars that are specifically optimized for local Hawaii conditions, whether through triploid, autoflowering, or tropical photoperiodic traits, Hawaii's hemp farmers can achieve higher yields and better quality. Establishing a reliable source of these Hawaii-specific seeds will be critical in supporting the industry's growth and sustainability, benefiting the entire agricultural community.

2. Recommendations Seed and Cultivar, Hawaii-specific Research Needs

- a. The Hemp Task Force recommends the state incentivize all sectors of the hemp industry, ensuring that all sectors are offered the supporting consideration and that a group representative of all sectors in the hemp industry represented proportionately by island by the number of USDA hemp licenses be convened to meet and determine the best methods to support each sector. If this group cannot be convened then grants and other forms of support for all sectors be made available through a competitive and transparent process that are weighted to support local, Hawaii farmers and Hawaii based companies.

E. Food and Animal Feed

1. Findings

Hemp seeds, rich in protein, essential fatty acids, and minerals, offer a nutritious and sustainable food for human consumption. The FDA has already deemed hemp seed, oil, hearts, and protein powder as Generally Recognized as Safe (GRAS) for human consumption. Hemp seeds are already used in everything from granola to cookies to acai bowls and are a popular natural, health food.

Smaller grain projects that support community food independence have been successfully undertaken on the mainland U.S. and offer an opportunity for Hawaii's farms to diversify their food production. However, to make the initial production feasible farmers will need support to 1.) invest in the required infrastructure and 2.) produce a value-added product or sell direct to consumers to maximize margins. Industrial Hemp grown for seed presents new revenue streams for farmers and stimulates economic growth through processing facilities, distribution networks, and value-added product development.

Selecting suitable hemp cultivars adapted to Hawaii's climate and photoperiods is essential for maximizing yield and quality. Research and development initiatives focused on breeding resilient varieties for grain and animal feed need to continue and to be expanded.

Developing processing facilities for dehulling, and oil extraction is crucial to unlocking the full potential of hemp grain production. The Maui-based company has the infrastructure necessary to support the scalability of the industry.

Utilizing hemp and by-products of industrial hemp as an ingredient for animal feed is a very promising, high nutrient, potential feed source for Hawaii livestock producers. The passage of the 2018 Agricultural Improvement Act ("Farm Bill") has sparked an increased interest in using hemp in commercial animal feed.

In 2022, the Association of American Feed Control Officials ("AAFCO") and the National Industrial Hemp Council of America ("NIHC") co-hosted a webinar and national discussion on "Hemp as Feed Ingredient". Some of the key takeaways from this discussion are that multi-industry collaborations and state feed programs can encourage research and help collect the safety data needed to help advance the hemp animal feed sector.

Hawaii livestock producers face some of the highest feed costs in the Country. Hawaii grown hemp and hemp by-products used as an ingredient in animal/livestock feed provides an opportunity to enhance local food security, reduce feed costs, reduce carbon emissions and would benefit producers raising:

- laying hens/poultry (eggs)
- broiler chickens and other poultry (meat)
- cattle (meat & dairy)
- pig (meat)
- sheep (meat & dairy)
- goat (meat & dairy)
- rabbit (meat)
- fish (such as but not limited to tilapia)

Hawaiian grown hemp could potentially be used to supplement the diets of non-food animals as well such as:

- horses
- dogs
- cats

AAFCO has approved hemp as a feed for laying hens and has provided the following-new tentative definition of hemp feed for laying hens.

" New Tentative Definition T71.5 Hemp Seed Meal, Mechanical Extracted is the

product obtained by grinding or milling the cake, which remains after most of the oil is removed from the seeds of Cannabis sativa L. by a mechanical extraction process. The ingredient must be labeled with guarantees for minimum crude protein and maximum crude fat on an as-fed basis. The meal shall contain no more than 20 ppm of total cannabidiol (Total CBD = CBD + (CBDA x 0.877)) and no more than 2 ppm of total tetrahydrocannabinol (Total THC = delta-9-THC + (THCA x 0.877)). It is used in diets of laying hens as a source of protein and fat at an inclusion of no more than 20% of the diet."

Conclusion

Hemp seeds, rich in protein, essential fatty acids, and minerals, offer a nutritious and sustainable food for human consumption. Hemp seeds can also be used for animal feed and the laws are beginning to change to allow that. Recently, hemp has moved one step closer to approval as a feed for laying hens after a key U.S. Food & Drug Administration (FDA) agency signed off on a definition of "hemp seed meal" (HSM). Varietal research and support for infrastructure is key to getting this industry off the ground in Hawaii, while support Hawaii's food security and self-sufficiency goals.

2. Recommendations Food and Animal Feed

- a. Support the varietal research called for in the Classification of Hemp and Cultivars and Hawaii-specific Research Needs section.
- b. The Hemp Task Force recommends the state incentivize all sectors of the hemp industry, ensuring that all sectors are offered the supporting consideration and that a group representative of all sectors in the hemp industry represented proportionately by island by the number of USDA hemp licenses be convened to meet and determine the best methods to support each sector. If this group cannot be convened then grants and other forms of support for all sectors be made available through a competitive and transparent process that are weighted to support local, Hawaii farmers and Hawaii based companies.
- c. The state immediately adopt the tentative Association of American Feed Control Officials hemp feed definition for laying hens.
- d. Provide grants University of Hawaii and Hawaii Department of Agriculture to partner with hemp farmers to research hemp fed to livestock including but not limited to cattle.
- e. For research purposes, the State should allow hemp biomass animal/livestock feed in Hawaii with less restrictions than the AAFCO process to support accelerate research in this area and identify market potential and safety.
- f. Allow the sale of the products (dairy, meat, poultry broilers) from hemp fed animals in Hawaii.

- g. Allow Hawaii hemp farmers to conduct individual research and sell the related hemp fed livestock products in state as long as the consumer receives written notification that the animal was fed hemp for feed.

F. Cannabinoids

1. Findings

Legislative intent has been to build a safe, thriving and nationally competitive hemp industry, including premium, Hawaiian-grown and manufactured, branded full spectrum and cannabinoid hemp products. These products can participate in the nationally booming hemp cannabinoid sector. This is in-line with Hawaii's goal of sustainable local agriculture.

There is significant opportunity to move the dial in Hawaii agriculture with the full spectrum hemp and cannabinoid sector. It is low hanging fruit, so to speak, as there is an established market for these products – residents are spending \$54 million annually. If Hawaii farmers could capture even 25% of the market, it would move the dial on agriculture in Hawaii, creating \$16 million in revenue for local farmers and hemp businesses. This move also supports food security goals because most cannabinoid farmers in Hawaii also grow food and the margins of cannabinoid products can help offset the costs of growing food.

To be able to meaningfully participate in the existing Hawaii cannabinoid market, farmers need marketing support to help their products rise above the noise, as well as regulatory stability, and an even playing field that requires imports to meet Hawaii standards and allows Hawaii farmers and manufacturers to make and sell the products that are being imported by residents, which are currently not allowed.

- a. Like all the hemp sectors, cannabinoid hemp especially needs regulatory stability as this sector has experienced the greatest regulatory flux, costing Hawaii hemp farmers significant losses. Many of Hawaii's hemp farmers are no longer farming or processing hemp because of the regulatory flux, especially, with regard to regulations for full spectrum and cannabinoid hemp processing and manufacturing. Both the legislature and/or the DOH have often revised hemp laws and rules, occasionally enacting new rules before it is possible to gauge the effectiveness or impact of the earlier regulations. This pattern of legislative and rule flux, often without notice, has had a negative impact on the local industry. This flux demands navigating often conflicting requirements and has introduced great uncertainty and furthered the reputation that Hawaii is over-regulated, and unfriendly to business development. As a result, investment has been hindered, projects cancelled, growth stagnated, and has unnecessarily created contentious relationships among farmers, retailers, and local agencies.
- b. Regulating hemp under a combined authority with cannabis as proposed by the 2024 recreational cannabis bill SB 3335 has had deleterious effects on farmers in other states including the loss of banking and insurance. The state ignored the expert information and

data provided by the leading hemp and cannabis economist, Beau Whitney, and attorney and farmer Anne van Leynseele, both of whom have significant experience with the impacts of hemp and cannabis policies and regulations in other states. Their letters and information shared with the state outlined why moving Hawaii hemp under a cannabis or cannabis commission will have negative effects.

- c. Buffer restrictions for cultivation and processing have eliminated cultivation and processing opportunities, as well as eliminated the option to farm hemp for some farmers.
- d. Full spectrum hemp gummies are nationally the most popular product category; however, Hawaii farmers and manufacturers have not been able to participate in this market. This is in stark contrast with nearly every other state.
- e. DOH is now proposing that gummies be allowed, but with an unrealistic, immediately implemented ultra-low THC edible limit (1mg/serving and only 5-10mg/container) which would be amongst the most restrictive in the USA.
- f. Remediating hemp to the proposed DOH levels would typically require sophisticated THC removal with extractive equipment that is very expensive and out of the reach for most farmers. Hawaii is uniquely disadvantaged to remediate the extracts due to its geographic isolation, high costs, and small size. The largest extractor and only toll processor in the state, a Kauai-based hemp company, has stated that it cannot continue in business with these rules because the company's primary income comes from tinctures that will not meet the new DOH requirements; not from processing. It is not feasible to ship hemp to the mainland for processing – far too expensive for Hawaii farmers. Further, full spectrum cannabinoid hemp can quickly degrade during shipping, greatly reducing the value of the crop and increasing expenses.
- g. Chemically isolated, highly refined products are not what customers want. National data show that customers want full spectrum natural gummies, particularly for high-value, premium products where Hawaii can gain market share. This customer preference trend would further hinder investment or establishment of new processors in state that can remediate/remove THC from hemp extracts because there would be low to no demand for the end products made from processed Hawaii cannabinoid hemp.
- h. Proposed DOH rules have an economic and feasibility impact on local industry that will make compliance difficult for hemp farmers and businesses. DOH has not identified an urgent health emergency that warrants the need for the ultra-low levels of THC in their proposed rules. DOH stated they have no requirement or mandate to justify the decision regarding compound limits.
- i. The current DOH effective enforcement policy on gummies can be seen on their website as "gummies are not allowed". It is understood that enforcement especially against synthetic cannabinoids (Delta 8, etc.) has been difficult because of staffing and budgetary limitations and various legal issues and challenges regarding synthetic products. These non-compliant

synthetics can now be found throughout Hawaii and typically don't meet the requirements for Hawaii's testing and labeling laws. Because these mostly imported products usually don't comply with Hawaii's testing regulations, consumers can't be assured that these products are free of contaminants like solvents, heavy metals or pesticides that exceed DOH standards. This undermines the responsible Hawaii grown hemp product market.

- j. Hawaii's testing laws for final full spectrum and cannabinoid products such as tinctures and salves, are amongst the toughest and most expensive in the U.S.; typically, \$650 for a single batch for one product. While costly, the hemp industry has embraced these testing standards to confirm the high quality of Hawaii grown and made products. However, to remain competitive with the flood of imports that are not required to meet Hawaii's testing laws and because many hemp farmers produce smaller batches of products more often, subsidizing product testing would help to level the uneven playing field.
- k. There is a need for additional full spectrum and cannabinoid hemp processing. Farmers have suggested establishing facilities to be shared on Hawaii Island, Maui, and Oahu and/or provide grant funding for farmers to establish small scale processing on their farm.
- l. Hawaii farmers need crops that can be processed into high margin value added products to offset the high costs of food production and farming in general in Hawaii. Hemp grown for full spectrum products and cannabinoids offers exactly this for farmers. Many of the Hawaii farmers that have grown hemp also grow food, so the full spectrum hemp products offer a way to offset the high cost of food production for small family farms.
- m. Hawaii hemp farmers hope to build the Hawaii cannabinoid business around a Kona coffee model, offering high quality boutique hemp products, which could provide financial stability for family farms.
- n. A number of full spectrum hemp and cannabinoid farmers are also involved in other hemp sectors. Some grow for food (microgreens) and have also grown hemp for fiber and are interested in diversifying their equipment and farm to include small scale fiber operations that require minimal processing.
- o. Hemp seed oil, hempcrete, and hemp tinctures are all technically manufactured hemp products. Current DOH nomenclature for cannabinoid products is "manufactured hemp product", which can be confusing.

Conclusion

Significantly, residents already spend \$54 million on hemp cannabinoid products per 2020 estimates, but these products are mostly imports that don't meet Hawaii regulations or standards¹. With minimal marketing support and allowing farmers and Hawaii businesses to produce the products residents want, it is likely Hawaii farmers could capture 25% of this large existing in-state market so that at least \$16 million that now goes to mainland farmers and

business will stay in Hawaii; which is not representative of the total addressable national U.S. market for cannabinoids of \$28 billion that Hawaii farmers could participate in.²

While the intent of the legislature was to create a safe, regulated hemp industry, state regulations have inadvertently hurt those farmers and manufacturers that work to comply, while imports that may or may not meet Hawaii standards are flourishing. Further, Hawaii farmers and manufacturers have been prevented from making and selling the most popular cannabinoid product, gummies. Quality local retailers who have long-term relationships with their customers, vet their vendors, check lab reports, have insurance, and generally are inclined towards compliance are therefore excluded along with responsible local manufacturers. This undermines the goals of the DOH and the legislature.

2. Recommendations Cannabinoids

- a. Move the regulation of processing and manufacturing of hemp for cannabinoids to an independent hemp program, titled "Hemp Program, "Office of Hemp" or similar title. DOH should move personnel and resources for enforcement currently assigned to hemp under the Office of Medical Cannabis to this new hemp program in DOH. The regulatory structure of hemp, including hemp grown for cannabinoids, should remain independent and separate from the regulatory work and structures for cannabis, including future recreational cannabis if it is allowed.
- b. Support the continued regulation of the hemp industry by the U.S. Department of Agriculture, Hawaii Department of Agriculture, and the Hawaii Department of Health. Hemp should be excluded from future recreational or medical cannabis legislation. SB 3335 that was proposed in 2024 legislative session is an example of a bill in which the hemp industry does not was to be included.
- c. Do not introduce any *disruptive* legislation and rules for three years. Disruptive rules and legislation include, adding definitions that conflict with and/or are more restrictive than Federal definitions; legislation or rules that would narrow market opportunities and/or render Hawaii farmers, processors, and manufacturers less competitive with import and mainland businesses; imposing additional taxes or fees; moving cannabinoid hemp to a new regulatory agency other than a stand-alone hemp program under the Department of Health; additional permitting or licensing requirements for the industry or Hawaii wholesalers or retailers; actions that might result in the loss of business services for farmers, processors, or manufacturers, especially banking, insurance, and marketing platforms; additional constraints of or testing during cultivation, transportation, processing, or manufacturing; and/or any action that an investor might reasonably identify as indicating the Hawaii hemp industry is becoming more restrictive and/or lacks a stable regulatory environment. Legislation called for in this report is not disruptive.
- d. DOH adopts rules that include reasonable per serving THC limits that are in line with most of the rest of the country and which are backed by scientific study. It is recommended Hawaii rules follow the widely applauded and nationally emulated Minnesota law of 5 mg

THC per serving and no greater than 50 mg of THC per package for edibles and 10 mg per beverage, but also includes the following restrictions in item e.) below. DOH new zero and ultra-low THC limit policy, all of which are unrealistic for Hawaii farmers and manufacturers to comply with and will irreversibly damage local industry.

- e. To prevent THC from getting into the hands of children and youth, Hawaii needs clear, simple rules that address this and are broad enough to cover potential synthetic psychoactive cannabinoids which currently exploit technical loopholes to circumvent federal regulatory definitions – not a blanket policy which prohibits nearly everything and destroys the Hawaii grown industry, while imports thrive.
 - o Simply restrict to 21 years or older on retail sales or possession all full spectrum and cannabinoid hemp food and beverage hemp products.
 - o Do not require businesses or farmers to obtain permits to sell cannabinoids to adults. This would all but eliminate many farmer outlets because smaller retails can't afford the extra cost or time to secure the license and don't want the perceived liability. Instead educate the public, retailers, and the industry that sales are to be restricted to adults.
 - o Packaging should not entice youth and shall not include cartoon characters or emulate children's brands like candies and cereals or children's vitamins.
- f. Ensure that existing legal products are not subject to the restrictions in d.) above but must continue to adhere to the Federal 0.3% THC limit, e.g. soaps, salves, lotions, tinctures, etc. These products have not caused the problems caused by imported gummies and edibles.
- g. DOH should update their website once new rules are issued to reflect that gummies with other edibles and beverages are allowed.
- h. DOH should communicate proactively about potential rules and/or legislation and/or concerns before drafting rules or supporting new legislation including consulting transparently and publicly with experts, stakeholders, and industry to understand the basis and feasibility of the decision making and whether there are non-regulatory ways to achieve the desired outcomes DOH is seeking.
- i. Any new DOH rules should be given adequate notice (6 months+) along with an education campaign so industry has time to adapt.
- j. DOH rename "manufactured hemp product" to "manufactured hemp extract product" ("mhcp"), or "manufactured hemp cannabinoid product" ("mhcp") to facilitate clear communication across industrial hemp sectors.
- k. The Hemp Task Force recommends the state incentivize all sectors of the hemp industry, ensuring that all sectors are offered the supporting consideration and that a group representative of all sectors in the hemp industry represented proportionately by island by the number of USDA hemp licenses be convened to meet and determine the best methods to support each sector. If this group cannot be convened then grants and other forms of

support for all sectors be made available through a competitive and transparent process that are weighted to support local, Hawaii farmers and Hawaii based companies.

- l. Reduce DOH Hemp Processor Permit application and renewal fees to \$50 for three years to make the application process feasible for more farmers and to encourage small scale processing to help Hawaii farmers and manufacturers capture more of the \$54 million Hawaii cannabinoid market that is dominated by imports.
- m. Make available \$3,600 per year in tax credits for laboratory testing of Hawaii grown full spectrum and cannabinoid products for Hawaii farmers that have an active USDA. hemp license. 100% of the cannabinoids and full spectrum in these products must be from 100% Hawaii grown hemp and the products must be manufactured in Hawaii. The tax credits should be available for 36 months to level the playing field and allow Hawaii farmers an opportunity to access the huge import market upon which Hawaii residents spend nearly \$54 million per year.
- n. Determine the potential to for Hawaii farmers to conduct research with the University of Hawaii as allowed per the Medical Marijuana and Cannabinol Research Expansion Act Public Law 117-215. This federal law may allow UH to design a study under UH John A Burns School of Medicine to study the cannabiniol produced by Hawaii hemp farmers.
- o. Hawaii should allow the sale of hemp flower, pre-rolls and water-based concentrates to adults over 21 years of age following the state rules on tobacco smoking location restrictions. Legislation to allow this should be introduced as a stand-alone bill.
- p. Recommend ongoing hemp farmer and university partnership to further the cannabinoid hemp industry needs including but not limited to research and development, courses, textbooks, peer-reviewed field studies, internships, germplasm repository/distribution, analytics, incubator programs and to pursue grant funding for hemp.

IV. Action Tables to Facilitate Implementation of Recommendations

Please see the following pages for tables that summarize the recommendations and identify how to implement the recommendations and the responsible party for implementation as identified by the Hawaii Hemp Task Force in consultation with the Department of Agriculture and Department of Health.

Tables include,

- A. All Sectors (those recommendations that apply to all sectors below, B-F.)
- B. Fiber and Building Materials
- C. Fuel and Biomass
- D. Seed and Cultivar, Hawaii-specific Research Needs
- E. Food and Animal Feed
- F. Cannabinoids

All Sectors

Fiber and Building Materials, Fuel, Food and Animal Feed, Cultivar Research, and Cannabinoids

Actions to Facilitate Recommendation Implementation

(See report from Hawaii Hemp Task Force for details on recommendations, page 9)

Rec #	Recommendation	Action	Who	Date Completed
a.	To comply with Federal law, the biofuel and biomass sector requires that the state allow the use of the whole plant, including leaves, to align Hawaii with Federal regulations.	See individual sector recommendations. Preferably by rulemaking authority, redefine biomass to include leaves. Halt disruptive legislation for three years. See cannabinoid section for the definition of disruptive. As needed, align state laws and rules with Federal laws and rules.	Legislature, DOH, DOA	
b.	Encourage investment and dispel Hawaii's reputation for discouraging innovation.	By Dec 31, 2024, an official memorandum should be issued affirming the legality of hemp in Hawaii to landowners, financial institutions including mortgage companies, insurance companies, and all of Hawaii's County Mayors to be shared with all County departments. See recommendation narrative for more detail	Attorney General's Office	
c.	Direct financial institutions not to discriminate against hemp farms and businesses.	Legislation for 2025 session. DOA submit bill.	DOA, Legislature	
d.	Require all insurance companies doing	By Dec 31, 2024, DOA send letter	DOA, Hawaii	

	business in the state of Hawaii to offer hemp farmers and hemp processors the same coverage options for the same prices as other crops.	to the Hawaii Insurance Division requesting this communication to insurance companies.	Insurance Division	
e.	Permanently exclude hemp from any future “Cannabis Regulatory Agency” or similar proposed agency as was proposed during the 2024 Legislative session per the recreational cannabis bill, SB 3335.	By Oct. 1, 2024, DOA send letter to its sister agencies and the Legislature highlighting this request on behalf of the Hawaii Hemp Task Force	Legislature/DOH/DOA Attorney General’s Office	
f.	If sub-classifying industrial uses for exclusions from Hawaii Department of Health regulations, hemp shall include hemp production for all uses other than cannabinoids, including but not limited to production for seed, biomass and biofuels, fiber, animal feed, and food.	Not needed currently.	DOA/DOH	
g.	Eliminate all buffers for cultivation and processing, except for schools and hospitals.	By January 1, 2025, preferably through rulemaking. Otherwise introduce bill to do the same.	DOA	
h.	Eliminate transportation reporting requirements for hemp.	By January 1, 2025, preferably through rulemaking. Otherwise introduce bill to do the same.	DOA	
i.	Develop and approve Performance Based Sampling Protocols with hemp farmers.	By July 1, 2025, develop protocols.	DOA working with USDA and Hawaii hemp farmers.	
j.	Support seed breeding to develop an adequate supply and range of hemp seed varietals that can thrive in Hawaii’s unique micro-climates and photoperiods.	See recommendations in the Cultivar and Seed Research section.	See recommendations in the Cultivar and Seed Research section.	
k.	Support applied research collaborations	See recommendations in each of	See recommendations	

	between Hawaii educational institutions and farmers, processors, and manufacturers. This can accelerate the transfer of knowledge into the industry.	the sector subsections (fiber, fuel, food, cannabinoid, etc.).	in each of the sector subsections (fiber, fuel, food, cannabinoid, etc.).	
l.	Provide no interest loans for non-immigrant labor with H-2A work visas	Review pathway the Department of Education used to allow teachers from other countries for whom the state provided similar support.	DOA	
m.	Offer grants for three years to offset labor costs for hiring residents.	DOA should review what has been done by the Dept of Labor and Dept of Education and outline how to create their own program, by July 1, 2025.	DOA, Department of Labor working with Dept of Education	
n.	Support work force development for labor required for the hemp industry. Give weight to organizations providing certifications that are transferable.	By Dec 31, 2024, DOA send a request to Dept of Labor to draft an outline on how work force development can be supported for the hemp industry.	Department of Labor	
o.	Accelerate the development of all sectors.	The Hemp Task Force recommends the state incentivize all sectors of the hemp industry, ensuring that all sectors are offered the supporting consideration and that a group representative of all sectors in the hemp industry represented proportionately by island by the number of USDA hemp licenses be convened to meet and	DOA	

		determine the best methods to support each sector. If this group cannot be convened then grants and other forms of support for all sectors be made available through a competitive and transparent process that are weighted to support local, Hawaii farmers and Hawaii based companies.		
p.	Establish two FTEs to act as Hemp Coordinators and the intermediary between hemp producers and the relevant state agency. See recommendations for detail on responsibilities so positions remain focused on hemp.	Budget request 2025. Hire one full time employee (FTE) for the Department of Agriculture and one full time employee for the Department of Health.	DOA, DOH	
p.1.	Clarify FTE responsibility (DOA)	Job duties will not be regulatory but focus on providing technical assistance	DOA	
p.2.	Clarify FTE responsibility (DOH)	Job duties will be to provide technical assistance to cannabinoid hemp processors and manufacturers	DOH	
q.	Continue bi-annual meetings of the Hawaii hemp task force	Update and recommend changes to this report and review progress of implementation.	DOA	

Fiber and Building

Actions to Facilitate Recommendation Implementation
 (See report from Hawaii Hemp Task Force for details on recommendations, page 17)

Rec #	Recommendation	Action	Who	Date Completed
a.	<p>Create a dual funding pathway for fiber processing facilities (large and small scale).</p> <p>The Hemp Task Force recommends the state incentivize all sectors of the hemp industry, ensuring that all sectors are offered the supporting consideration and that a group representative of all sectors in the hemp industry represented proportionately by island by the number of USDA hemp licenses be convened to meet and determine the best methods to support each sector. If this group cannot be convened then grants and other forms of support for all sectors be made available through a competitive and transparent process that are weighted to support local, Hawaii farmers and Hawaii based companies.</p>	By December 1, 2024, DOA convene a group representative of all sectors to determine best how to support the hemp industry financially, e.g. grants, tax credits, subsidies.	DOA	
b.	Subsidize the cultivation of hemp for farmers to ensure the processors have adequate supply at \$300/ton of biomass and \$0.40/lb for seeds.	2026 Budget request	DOA	
c.	The state Building Code Council of the Department of Accounting and General Services should update its codes and send a letter to all Hawaii counties asking them to update their	By Dec 31, 2024, send letter to Council requesting	DOA	

	building codes to include the 2024 Appendix BL Hemp-Lime (Hempcrete) Construction of the International Residential Code (IRC).			
d.	The state Building Code Council of the Department of Accounting and General Services or other appropriate agency shall add hemp and hemp building materials to its definitions of Green Materials per Hawaii Code R. § 15-217-59	By Dec 31, 2024, send letter to Council requesting	DOA	
d.	Department of Taxation shall offer a green building tax credit for buildings and homes where the primary structure is built with a significant portion of hemp – at least 30% of the materials, on par with the 35% tax credit offered for renewable energy systems.	Legislation, prefer stand-alone bill	Dept of Taxation	
f.	Convene a subcommittee of the Hawaii Hemp Task Force to oversee the building materials recommendations and facilitate speedy implementation.	DOA to convene task force per usual protocols.	DOA	
g.	The state should include hemp and hemp building materials in their building projects and require that any contracted building includes in the request for proposals weighted criteria to support the adoption and use of Hawaii grown hemp building materials.	By Dec 31, 2024, letter to sister agencies requesting as listed.	DOA	
h.	State agencies and county departments working on climate change and carbon sequestration technologies should include hemp building materials as a way to achieve their goals and objectives.	By Dec 31, 2024, send letter to all Hawaii County Mayor’s offices and sister agencies to alert them to hemp’s potential for sequestering carbon and mitigating climate change.	DOA	

Fuel and Biomass

Actions to Facilitate Recommendation Implementation
 (See report from Hawaii Hemp Task Force for details on recommendations, page 21)

Rec #	Recommendation	Action	Who	Date Completed
a.	Provide regulatory certainty and eliminate regulatory flux is critical. This is the same as Recommendation a. for All Sectors.	By August, 1 2025, redefine biomass definitions to include foliage per recommendation, through rulemaking. Otherwise, legislation that in no way further restricts the hemp industry.	DOH and DOA	
b.	Issue a statement directed to financial institutions and insurance companies and landowners stating unequivocally that hemp is a legal crop in Hawaii. This is the same as Recommendation b. for All Sectors.	Memorandum with elements in recommendation b in All Sectors sent to audience identified in recommendation.	Department of the Attorney General	
c.	Redefine hemp biomass to include both stalks and foliage material. Foliage material should be defined as the aggregate leaves, stems, and residual floral material. Foliage material should never be regulated, or excluded, from any framework used to define industrial hemp or industrial-use hemp.	By August, 1 2025, rulemaking – avoid legislation if existing authority for changing definition exists. Otherwise, stand-alone legislation that in no way further restricts the hemp industry.	DOH and DOA	
d.	The Hemp Task Force recommends the state incentivize all sectors of the hemp industry, ensuring that all sectors are offered the supporting consideration and that a group representative of all sectors in the hemp industry represented proportionately by island by the	By December 1, 2024, DOA convene a group representative of all sectors to determine best how to support the hemp industry financially, e.g., grants, tax credits, subsidies.	DOA	

	<p>number of USDA hemp licenses be convened to meet and determine the best methods to support each sector. If this group cannot be convened then grants and other forms of support for all sectors be made available through a competitive and transparent process that are weighted to support local, Hawaii farmers and Hawaii based companies.</p>			
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Seed and Cultivar, Hawaii-based Research Needs

Actions to Facilitate Recommendation Implementation

(See report from Hawaii Hemp Task Force for details on recommendations, page 26)

Rec #	Recommendation	Action	Who	Date Completed
a.	<p>The Hemp Task Force recommends the state incentivize all sectors of the hemp industry, ensuring that all sectors are offered the supporting consideration and that a group representative of all sectors in the hemp industry represented proportionately by island by the number of USDA hemp licenses be convened to meet and determine the best methods to support each sector. If this group cannot be convened then grants and other forms of support for all sectors be made available through a competitive and transparent process that are weighted to support local, Hawaii farmers and Hawaii based companies.</p>	<p>By December 1, 2024, DOA convene a group representative of all sectors to determine best how to support the hemp industry financially, e.g., grants, tax credits, subsidies.</p>	DOA	

Food and Animal Feed

Actions to Facilitate Recommendation Implementation

(See report from Hawaii Hemp Task Force for details on recommendations, page 28)

Rec #	Recommendation	Action	Who	Date Completed
a.	Support the varietal research grants called for in the Classification of Hemp and Cultivars and Hawaii-specific Research Needs section.	See Action table for Classification of Hemp and Cultivars and Hawaii-specific Research Needs section	DOA	
b.	The Hemp Task Force recommends the state incentivize all sectors of the hemp industry, ensuring that all sectors are offered the supporting consideration and that a group representative of all sectors in the hemp industry represented proportionately by island by the number of USDA hemp licenses be convened to meet and determine the best methods to support each sector. If this group cannot be convened then grants and other forms of support for all sectors be made available through a competitive and transparent process that are weighted to support local, Hawaii farmers and Hawaii based companies.	By December 1, 2024, DOA convene a group representative of all sectors to determine best how to support the hemp industry financially, e.g., grants, tax credits, subsidies.	DOA	
c.	The state immediately adopt the tentative AAFCO hemp feed definition for laying hens.	By July 1, 2025, DOA Commodities Branch draft a one-page outline about how to provide a pathway forward to adopt definition.	DOA	
d.	Provide grants to University of Hawaii and Hawaii Department of Agriculture to partner with hemp farmers to research hemp fed to livestock including but not limited to cattle.	UH Budget request 2025	UH	
e.	For research purposes, the State should allow hemp biomass	By July 1, 2025, DOA	DOA	

	animal/livestock feed in Hawaii with less restrictions than the AAFCO process to support accelerate research in this area and identify market potential and safety.	Commodities Branch draft a one-page outline about how to provide a pathway forward.		
f.	Allow the sale of the products (dairy, meat, poultry broilers) from hemp fed animals in Hawaii that are part of research projects with educational institutions.	By July 1, 2025, DOA Commodities Branch outline pathway to facilitate implementation of recommendation.	DOA	
g.	Allow Hawaii hemp farmers to conduct individual research and sell the related hemp fed livestock products in state as long as the consumer receives written notification that the animal was fed hemp for feed.	By July 1, 2025, DOA Commodities Branch outline pathway to facilitate implementation of recommendation.	DOA	

Cannabinoid Table of Recommendations on next page.

Cannabinoid

Actions to Facilitate Recommendation Implementation
 (See report from Hawaii Hemp Task Force for details on recommendations, page 32)

Rec #	Recommendation	Action	Who	Date Completed
a.	Establish an independent hemp program under DOH to cover all aspects of hemp including cannabinoids.	DOH to move staff and resources to establish separate hemp program out of Office of Medical Cannabis and keep regulatory structure independent of cannabis. DOH to advise the Legislature of additional resource funding requirements, if any.	DOH	
b.	Hemp should be excluded from future recreational or medical cannabis legislation.	No action, legislature to pass on legislation that proposes inclusion of hemp.	Legislature	
c.	Do not introduce disruptive legislation for 3 years	Do not introduce, until 2028, disruptive rules or legislation that is: <ul style="list-style-type: none"> - Conflicts/more restrictive than Federal. - Narrows market opportunities/renders Hawaii business less competitive than mainland/foreign - Additional permit/licensing for industry - Actions that may result in loss of services, like banking, insurance or marketing. 	Legislature, DOH, DOA	

		<ul style="list-style-type: none"> - Additional constraints or testing - Any action that will signal to investors that Hawaii is becoming more restrictive and/or lacks a stable regulatory environment. 		
d.	Adopt reasonable per serving THC limits, in line with the rest of the country and backed by scientific study.	Implement the applauded and nationally emulated Minnesota law of 5mg THC per serving and no greater than 50 mg of THC per package for edibles and 10 mg per beverage, with age-gating per (e) below.	DOH	
e.	Adopt age gating rules to address THC from getting into hands of children and youth	Restrict hemp edible and beverage products to 21 years old on retail and possession. Do not require separate permits to sell cannabinoids to adults. DOH to educate the public, retailers, and industry per policy statement or rule if has authority otherwise Legislature as standalone bill.	DOH, Department of the Attorney General, unless authority required in which case Legislature	
f.	Ensure that existing legal products (soaps, salves, lotions, tinctures), are not subject to the restrictions in d.) above but must continue to adhere to the Federal 0.3% THC limit. These products have not caused the problems caused by imported gummies and edibles.	No further rules or actions on currently allowed products - soaps, salves, lotions, tinctures, etc.	DOH	
g.	Support industry by informing the public and retailers of new rules which reflect gummies with other edibles and beverages are allowed.	Publish new rules prominently and clearly in hemp section on DOH website	DOH	

h.	DOH to better understand the feasibility of implementation and consequence on legislative intent before drafting new rules and first seek non-regulatory ways to achieve desired outcomes.	DOH to proactively communicate transparently and publicly with experts, stakeholders, and industry before drafting new rules.	DOH	
i.	Any new DOH rules should be announced in advance to give the public and industry time to adapt.	Any new restrictive rules should be given 6+ months notice with education campaign before enforcement phase.	DOH	
j.	Facilitate clear communication across industrial hemp sectors through better use of terminology.	DOH rename "manufactured hemp product" to "manufactured hemp extract product" ("mhpep"), or "manufactured hemp cannabinoid product" ("mhcp"). Implementation by rule or propose stand-alone bill if required.	DOH, unless authority required in which case Legislature	
k.	The Hemp Task Force recommends the state incentivize all sectors of the hemp industry, ensuring that all sectors are offered the supporting consideration and that a group representative of all sectors in the hemp industry represented proportionately by island by the number of USDA hemp licenses be convened to meet and determine the best methods to support each sector. If this group cannot be convened then grants and other forms of support for all sectors be made available through a competitive and transparent process that are weighted to support local, Hawaii farmers and Hawaii based companies.	By December 1, 2024, DOA convene a group representative of all sectors to determine best how to support the hemp industry financially, e.g., grants, tax credits, subsidies.	DOA	

l.	Reduce DOH Hemp Processor Permit application and renewal fees	Reduce fee to \$50 for three years	DOH	
m.	Support enhanced testing for laboratory testing of Hawaii grown full spectrum and cannabinoid products for Hawaii farmers that have an active USDA. hemp license. This will support marketing efforts to promote Hawaii products as safe and premium.	Make available through standalone bill \$3,600 per year in tax credits for 3 years for Hawaii farmers that have an active USDA. hemp license. 100% of the cannabinoids must be from 100% Hawaii grown hemp and the products must be manufactured and tested in Hawaii.	Legislature and Dept of Taxation	
n.	Determine the potential to for Hawaii farmers to conduct research with the University of Hawaii as allowed per the Medical Marijuana and Cannabinol Research Expansion Act Public Law 117-215. This federal law may allow UH to design a study under UH John A Burns School of Medicine to study the cannabinol produced by Hawaii hemp farmers.	By June 1, 2025, DOA sends a letter to the University of Hawaii JABSOM to request development of outline, reviewing 117-215 and draft a one-page outline of the primary steps to establishing a research program under this law in collaboration with hemp farmers.	DOA, University of Hawaii, John A. Burns School of Medicine	
o.	Like many other states, allow the sale of hemp flower, pre-rolls and water-based concentrates to adults over 21 years of age	Follow state rules on tobacco smoking location and age restrictions via standalone bill.	Legislature	
p.	Recommend ongoing hemp farmer and university partnership to further the cannabinoid hemp industry needs including but not limited to: R&D, courses, textbooks, peer-reviewed field studies, internships, germplasm repository/distribution, analytics, incubator programs and to pursue grant funding for hemp.	Bi-annual meetings with the hemp industry through an open invitation and meeting with the industry.	University of Hawaii	

References

1. Farmers are Fed Up with Government Regulations Hampering the Industries Potential, Civil Beat, Thomas Heaton, 2022, <https://www.civilbeat.org/2022/05/hemp-farmers-are-fed-up-with-government-regulations-hampering-the-industrys-potential/>
2. 2023 U.S. National Cannabinoid Report, Beau Whitney, Chief Economist, October 26, 2023, <https://whitneyeconomics.com/blog/us-national-cannabinoid-report---executive-summary>.
3. King, Kelly, personal communication via zoom during August 30, 2024, Task Force meeting showing Hawaii Electric Company graphic of Conceptual Hawaiian Electric Energy 2045 Energy Mix – Consolidated, 2024, https://youtu.be/K9ssHzXh1rM?si=CvhWDTIT_1OXoDwr
4. Industrial Hemp Market Size, Share & Industry Analysis, By Source (Organic and Conventional), By Type (Hemp Seed, Hemp Seed Oil, Hemp Fiber, and Others), By Application (Food [Dietary Supplements and Functional Foods], Beverages, Personal Care & Cosmetics, Textiles, Pharmaceuticals, and Others), and Regional Forecast, 2024-2032, Fortune Business Insights, 2024.
5. Cannabidiol (CBD) Market Size, Share & Industry Analysis, By Source (Marijuana and Hemp), Application (Food & Beverages, Pharmaceuticals, Pet Care, Cosmetics, and Others), and Regional Forecast, 2024-2032, Fortune Business Insights, 2024
6. Email sent to the Department of Agriculture consultants on which the Chair of the Task Force, Gail Byrne Baber, was copied, July 2024.