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Making Headway on the Hemp Industry in Colorado: The CHAMP Initiative

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Abstract

Establishing state hemp programs in the U.S. West creates an increased need for economic professionals to understand key supply chain issues for this new alternative crop. The Colorado Hemp Advancement Management Plan (CHAMP) is a comprehensive blueprint for the state's fledgling hemp industry. Making the plan entailed an examination of the complete supply chain, with input gathered from over 150 stakeholders organized into 8 thematic supply chain groups. This article reflects on the CHAMP initiative by describing the state's hemp sector and summarizing key issues related to research and development, cultivation, testing, processing, transportation, manufacturing, and banking and insurance segments of the supply chain. These issues will likely pertain to other western hemp programs beyond Colorado as they also make headway into this sector.

Introduction and Background

As a new cash crop for the U.S. West, industrial hemp has received considerable attention from public and private stakeholders who view it as a potential alternative enterprise to improve producer profitability and well-being. In addition, industrial hemp may stimulate economic development through job and business creation in downstream segments of the supply chain. Yet, integration of a new crop such as hemp into state, regional, and national economies presents considerable challenges. Many growers in early hemp-producing states received healthy profits as the crop first became legalized. More recently, the industry has seen a rapid decline in prices as the result of surging supply and stagnant demand prospects. Furthermore, cultivating, processing, and marketing of hemp products are highly regulated undertakings due the crop's similarities to marijuana. The effect of this connection also impacts supporting sectors such as research and development, banking and insurance, transportation, manufacturing, and retail.

Colorado was an early mover in reintroducing hemp to the United States, establishing a state hemp pilot program in 2014 under the 2014 Farm Bill (Agricultural Act of 2014). Colorado was one of only four states to report hemp acreage in 2014. As of July 2020, Colorado's program continues under its pilot status, but will transition to a new state plan later in the year that aligns with updated hemp provisions in the USDA's Interim Final Rule (IFR) and the 2018 Farm Bill (Agricultural Improvement Act of 2018). During this pilot period, Colorado's hemp rules and regulations continuously evolved in response to feedback to improve their effectiveness, increase efficiency and transparency, and adapt to unanticipated issues and challenges. A key process to gather this input was the Colorado Hemp Advancement and

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Management Plan (CHAMP) initiative. This initiative involved numerous in-person feedback sessions with over 150 participating individuals who represented stakeholders from 8 hemp supply chain segments: research and development, cultivation, testing, processing, transportation, manufacturing, marketing, and banking and finance.

The 2018 legislation allows for hemp production in all states, tribes, or territories with an approved state plan. It also harmonizes state-level rules regarding inspection, sampling, and testing for THC and authorizes federal programs to offer products such as loans and crop insurance to hemp growers. Nevertheless, states, tribes and territories retain flexibility in developing their plan in accordance with their agricultural, economic, and regulatory contexts. The early experience of Colorado and the participatory CHAMP input gathering process stand to offer lessons to other states only recently approving hemp cultivation. In this article, we provide brief context on Colorado's hemp sector and then summarize key supply chain topics identified by stakeholders as part of the CHAMP initiative process. These topics will likely be relevant to other western states.

Hemp in Colorado: A Snapshot

The Colorado hemp industry is still emerging, and few sources of concrete data exist. The Colorado Department of Agriculture's Industrial Hemp Program (CDA-IHP) oversees rules and regulations related to hemp seed certification, cultivation, inspection, and handling. Colorado hemp producers are not required to use certified hemp seed but doing so can reduce risks associated with varietal impurities, poor germination rates, or high THC levels. Currently, there are 17 hemp cultivars approved into the seed certification program (CDA, 2019).

In terms of cultivation, statistics reported by CDA-IHP show registered hemp area increasing from 1,811 to 88,743 acres between 2014 and 2019--more than a forty-fold factor--with the number approximately doubling year over year during that period (CDA, 2020a). Registered indoor square footage saw a similar magnitude increase in area rising from 0.3 million square feet (s.f.) to 15.4 million s.f. over the same period. Figure 1 shows the location of registered hemp acres by county. Hemp production appears to be relatively well distributed across the state. Although some regional concentrations of higher production and some counties without registered acreage exist. Importantly, actual acres and square footage planted and harvested are consistently lower than hemp area registered due to factors such as grower inexperience, a lack of financing, or inability to secure inputs like seed or clones. With national declines in prices of up to 80% for raw and processed hemp products in 2019, expected registered and actual hemp acreage in 2020 is anticipated to fall below 2019 levels.

Under state pilot program provisions, CDA-IHP selected a sample of hemp registrations at random for on-farm inspection each year. Most recently in 2019, CDA-IHP inspected just under 25% of the total hemp registrations. Samples representing about 17% of the acres tested were found to be non-compliant with established THC thresholds (State of Colorado, 2020). A large majority of the non-compliant samples were below a 1% THC threshold, with only a handful above that level. As Colorado transitions away from operating under its 2014 pilot program and into an updated state plan approved by the USDA under the 2018 Farm Bill, inspections will be required of all hemp registrations, not just a random sample of the population.

The relative importance of hemp cultivation in Colorado can be understood by comparing its footprint to other specialty crops in the state, and by comparing it to other hemp-producing states. Within Colorado, the 2019 registered hemp area of over 88,000 acres is about 75% larger than that for potatoes, the number one specialty crop in Colorado in terms of value of production.

Even if hemp area remains below 2019 levels going forward, it will likely remain an economically significant crop for the state. When comparing hemp area in Colorado to other states, Colorado may also be seen as a national leader. In 2018, Colorado was the largest of only four states (Colorado, Kentucky, Montana, and Oregon) which had reported a hemp area above 5,000 acres. In total, Colorado hemp acreage that year represented around one-third of total reported U.S. hemp acreage (Mark et. al, 2020).

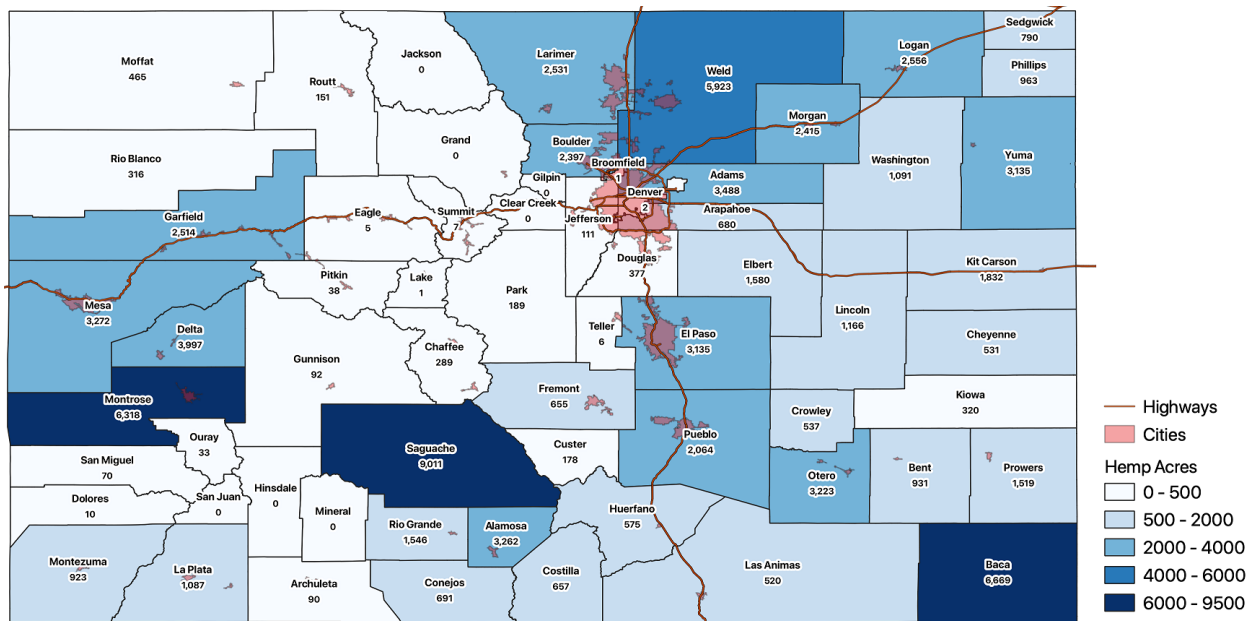


Figure 1. Registered Hemp Acres by County, 2018

Future patterns of hemp production will be influenced by multiple factors that are hard to predict, such as the continued number of hemp growers, average hemp area planted, and processing capacity. Many registrations during the pilot program period were for small- to micro-sized areas of less than one to two acres. Turnover was also a factor with many registrants producing hemp for only a single year. Anecdotal evidence also suggests that production and marketing contracts played an important role in grower access to processing, but more information is needed to evaluate this.

The continued development of vertical relationships and spot markets for raw and processed hemp products is therefore expected to shape the sector. Reliable information on hemp marketing channels is scarce, but the CDA maintains lists of approved product dealers and commodity handlers with over 160 approved dealers and over 30 approved handlers, respectively, for hemp as of mid-2020 (CDA, 2020b).

The Colorado Department of Public Health and Environment (CDPHE) maintains a list of extraction and food processing businesses that are approved to supply food- and supplement-grade hemp products such as CBD, other essential oils, or protein. Between 2017 and spring 2020, the CDPHE approved over 640 hemp-related businesses, including over 110 extractors. About three-quarters continue to handle hemp as of mid-2020.

While these numbers provide insight into the potential for job and business creation within the hemp sector, they do not capture all possible hemp processing and manufacturing applications. However, we could not identify a comparable source of information on other hemp manufacturers and processors that produce non-food industrial items like textiles or building materials.

Colorado Hemp Advancement Management Plan (CHAMP)

Conversations with stakeholders across the supply chain have always been important to emerging markets, and Colorado’s state hemp pilot program is no exception. Colorado has taken steps to increase conversations and engage stakeholders about its emerging hemp industry. In the summer of 2019, Colorado Governor Jared Polis announced the Colorado Hemp Advancement Management Plan (CHAMP) initiative. The initiative involved an examination of the complete industrial hemp supply chain with the goal of establishing a comprehensive blueprint for managing and advancing the emerging industrial hemp industry. Under the CHAMP initiative, stakeholder groups convened to provide a platform for stakeholders to work together to identify key issues and actions for the emerging industry.

The CHAMP initiative created a structure under which industry experts, tribes, local governments, regulatory agencies and farmers could sit around a table together. In total, 8 stakeholder groups with 15-25 participants each were formed around different segments of the hemp supply chain. In addition to the identified stakeholders, all stakeholder meetings were open to the public to listen and provide feedback. The focus of these 8 groups spanned the hemp supply chain and were: R&D and seed, cultivation, testing, transportation, processing, manufacturing, marketing, and banking and insurance (Figure 2). The CHAMP process lasted a little over a year with each stakeholder group holding three in-person discussion meetings which identified key issues, possible actions, and future needs.

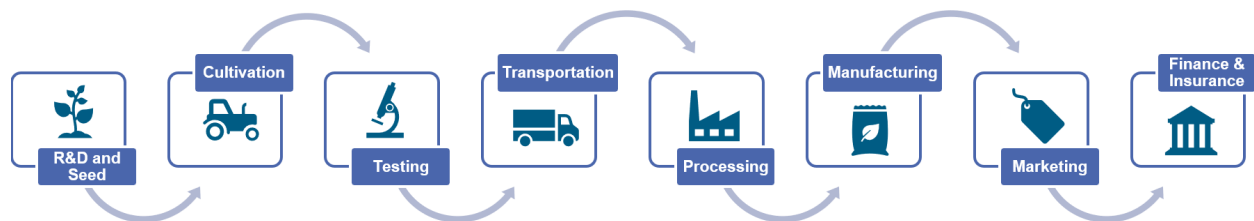


Figure 2. Schematic of the Eight CHAMP Stakeholder Groups

Output from these stakeholder discussions form the backbone of the final CHAMP blueprint report which will be released in Fall 2020. The blueprint report will address current agency oversight and resources, as well as stakeholder suggestions for future industry guidelines, and areas where further research and/or support is needed for each of the identified key issues. The key issues, or recommendations, were identified through an iterative process. In July 2019, the CHAMP executive committee met to develop initial discussion topics for each stakeholder group. The stakeholder groups met throughout 2019 with the opportunity to add other topics. Then, topics were compiled and consolidated to create action items around the key issues. These

key issues, as well as associated actions, identified by each of the 8 stakeholder groups are outlined below.

Economic professionals in other western states who are involved or interested in developing their own state plans and regulations will likely find the issues below, which were identified by our stakeholder groups, pertinent to their own contexts. The goal is for these recommendations to provide a regulatory foundation for the development of the hemp industry in Colorado and represent areas of general agreement among stakeholders.

Stakeholder Group 1: Research and Development and Seed

- Issue 1a: Hemp seed and clone certification: Colorado currently has a hemp seed certification program which stakeholders indicate should largely remain the same and includes THC verification completed by the Colorado Department of Agriculture. Suggestions for program enhancement include expanding the program to include a clonal certification and feminized seed certification.
- Issue 1b. Cross-pollination risk: Currently, producers must choose their crop location without an accurate understanding of the cross-pollination risk factors to which they are exposed. A need exists for the establishment of an information program where producers are notified of how many hemp crops are located nearby. This could be an enhancement to the current hemp producer database system to be combined with GPS data, creating a notification to producers when their crop is within a pre-determined distance of another registered hemp lot.
- Issue 1c. Seed production and genetic research: Current federal rules do not provide special provisions for genetic research and development for plant breeding. Seed research and development require trial and error across multiple generations before genetics are stabilized and predictable. This process may yield plant materials that violate the THC requirements. Once feasible under federal regulations, separate regulations need to be developed specific to seed research and development.

Stakeholder Group 2: Cultivation

- Issue 2a. Post-harvest testing and non-compliant plant material disposal: Federal rules require that non-compliant plant materials be destroyed. There are several areas where the current Colorado programs are not compatible with the present USDA IFR, but the state intends to make necessary adaptations. Over the longer term, stakeholders identified areas for rule adaptation that would preserve value in the supply chain, including post-harvest testing and THC remediation procedures. A necessary long-term policy is ensuring disposal regulations are not impracticably burdensome for the state or for hemp producers.
- Issue 2b. Coordination of state and local regulatory authority: Collaboration and information sharing among federal, tribal, state and local government agencies is needed to ensure hemp producers comply with state and local laws and requirements. Currently, information is shared upon request or on an ongoing basis subject to a memorandum of understanding. Developing a communication protocol which includes constant access to registration databases that facilitate compliance with all local rules and regulations was suggested under this recommendation.

- Issue 2c. Legal water supply: The current hemp registration application in Colorado has no guidance regarding legal water supply for hemp production. Recommendations indicate that the application be amended to include a checklist where registrants confirm they have or will obtain a legal water source before planting. This will help guide new producers to secure a legal water supply before planting and ensure that they may operate without potential shutdown because of orders from the division of water resources.
- Issue 2d. Colorado Industrial Hemp Center of Excellence: Currently research and development activities occur throughout Colorado in private corporations and universities. Currently, there is no coordinated and dedicated research institution for industrial hemp in Colorado. Stakeholders identified a need for a collaborative governing body, the Center of Excellence, between the relevant academic institutions, industry, state agencies and stakeholders across the state.

Stakeholder Group 3: Testing

- Issue 3a. Field sampling and sample agent certification: Historically, the CDA has conducted only random sampling of registrations each year to test for THC compliance, and new federal regulations require sampling all hemp. Starting in 2021, the CDA will need to increase coverage from 25-30% to 100% to comply with federal regulations. In order to comply, CDA will need to develop and implement a third-party sampling certification that allows for private certified agents to collect samples and deliver them to certified labs.
- Issue 3b. Hemp lab certification and testing program: In order to adhere to federal testing guidelines, Colorado will need to develop a new hemp testing program that includes guidelines for a new group of state-certified laboratories to test hemp and hemp products. This new program should include a certification process, requirements for testing methods and a framework for when state testing is required.

Stakeholder Group 4: Transportation

- Issue 4a. Electronic traceability system: Currently, there is no electronic hemp traceability system in Colorado. Stakeholders suggest that an electronic traceability system be created and implemented to ensure uninterrupted chain of custody for hemp products from harvest to commercial sale, and to provide secure and verifiable information to stakeholders. This new communication system can be modeled on existing protocols for shipping agricultural and non-hazardous manufactured products.
- Issue 4b. Transportation protocol: Currently, hemp transporters carry a manifest that must be registered with the CDA, as well as a certificate of analysis, but local law enforcement is often unclear on how to verify shipments. A successful industry will require standardization around this process. Existing rules and regulations need to be expanded to establish best practices and a protocol for transporting hemp. Due to the nature of hemp, specific protocols must be developed with input from numerous state agencies and hemp businesses.

Stakeholder Group 5: Processing

- Issue 5a. Hemp processor licensing and inspection: The hemp industry needs a well-maintained licensing system for hemp products, a program that clearly defines licensed activities, and a means for the state to register and review hemp processors in Colorado.

Colorado already has procedures and programs in place to regulate hemp. For example, hemp material and derivatives used in food processing or nutritional supplements are currently overseen by the CDPHE. However, further actions need to be taken to completely integrate all potential applications of hemp (e.g. non-food industrial uses) into the existing regulatory framework.

- Issue 5b. Hemp processor and manufacturer standards: A best practices program for good processing and manufacturing practices is needed to provide guidance to hemp processors and manufacturers on federal and state requirements. Colorado already has programs to regulate hemp processors and manufacturers. However, the CHAMP stakeholders propose extensions of existing regulations and new procedures when necessary. This includes legislation to extend CDPHE authority to hemp products and educational programs for new and existing manufacturers on how to comply with hemp regulations.

Stakeholder Group 6: Manufacturing

- Issue 6a. Manufacturer licensing: There is an existing framework and procedure for licensing in the food and supplement manufacturer program. Stakeholders identified the need to continue integrating hemp into existing procedures, as well as the need for clarity on how hemp licensing will differ from existing procedures for other products.

Stakeholder Group 7: Marketing

- Issue 7a. Glossary Development: As with every industry, industrial hemp has its own technical nomenclature and uses many terms that may be confusing to those not directly involved in the sector. A glossary of terms can be useful for the industry to standardize how products are defined along the supply chain. The stakeholder group has created an initial glossary which will be included in the CHAMP report.
- Issue 7b. Marketing and Labeling Guidance: Under the 2018 Farm Bill, the FDA maintains oversight of hemp-derived consumer products and is charged with protecting and promoting public health. The FDA has discovered many hemp products are being marketed with claims of therapeutic benefits or other claims that have not gone through an approval process. For these reasons, stakeholders identified a need for marketing and labeling guidance, implemented through CDPHE, which already has a framework in place.
- Issue 7c. State quality assurance certification program: Certification programs can provide a marketing alternative to commodity markets, allowing producers to be included under an umbrella program or label. Stakeholders discussed the potential for a third-party certification program that establishes a set of production processes and quality standards to assure buyers of the quality of the Colorado hemp products they are purchasing. Currently in Colorado there is no state-level certification and promotion for hemp products.
- Issue 7d. State procurement of industrial hemp products: Concerned about lack of market growth due to few industrial hemp product options for consumers to purchase, stakeholders encourage state procurement of industrial hemp products to support the emerging market. The solution proposed is to designate industrial hemp products in procurement goals as well as integrate industrial hemp products into current initiatives.

Stakeholder Group 8: Banking, Financial Services, and Insurance

- Issue 8a. Regulatory guidance and best practices: Stakeholders wish to destigmatize opening and holding accounts for hemp and hemp-related businesses. Further, stakeholders want to facilitate best practices to allow the hemp industry to be served similar to other agricultural products. To achieve this, enhanced guidance and outreach for service providers is needed. This guidance will come from both stakeholder engagement and written materials that support institutions seeking to serve the industrial hemp marketplace.
- Issue 8b. Expanded data availability: Presently, the CDA periodically publishes information that shows active registrations by county, but little published statistical data is available for hemp on which service providers can rely. Industrial hemp registration information needs to be available to banks and insurance carriers in structured formats that facilitate and expedite account servicing. Stakeholders discussed developing uniform standards for hemp-related data so information can be accurately collected and provided to service providers.

In addition to the recommendations discussed above, several recurring themes resonated across stakeholder groups. The themes below can be seen in recommendations across stakeholder groups and demonstrate the need to create a hemp regulatory context that is holistic across the supply chain.

- **Economic Development** – The CHAMP process revealed the need for broad initiatives focused on increasing research and awareness of industrial and consumer uses of hemp products. The purpose of these initiatives should be to drive future investment in processing and manufacturing facilities within Colorado as well as creating other intellectual property.
- **Chain of Custody and Information Sharing** – This was specifically touched on in the transportation recommendations but came up in discussions across the supply chain. Stakeholders stressed the need for traceability systems that create a chain of custody beginning at harvest and continuing to the final product. This uninterrupted chain of custody will assist in regulatory compliance, food safety and interstate commerce.
- **THC Control** – This is an important aspect of the industrial hemp industry and essential for compliance with federal regulations. A framework for understanding THC control and remediation at each point of transfer including remediation processing and non-consumable industrial processing was explored in numerous stakeholder meetings.
- **Federal Regulatory Compatibility** – In order to be successful, the Colorado hemp program must follow all federal laws and regulations as defined in the 2018 Farm Bill. Many of the policies and suggestions stemming from the stakeholder meetings are longer-term objectives and more progressive than federal law. These will not be able to be implemented until federal rules evolve.
- **Intergovernmental Coordination** – A common theme was the importance of close coordination among tribal and local governments and law enforcement agencies. This coordination will involve access to state electronic registration and other records.
- **Finance and Insurance** – The emerging industrial hemp industry will require stable access to standard finance and insurance products, which was discussed across the supply chain. Colorado can be a leader in guiding institutions seeking to serve this evolving marketplace.

Discussion

The engaged process of the CHAMP initiative is an important first step for Colorado as it makes headway on building an industrial hemp economy. The goal of this collaborative process was to lay the framework for developing a robust and functional hemp industry in Colorado. By including stakeholders, Colorado will develop state policies and regulations that support the industry while also allowing their input to be heard nationally through Colorado's response to the USDA establishment of a domestic hemp program interim final rule. While time consuming, the process is replicable and could provide a template for some states to follow.

The supply chain issues identified by Colorado stakeholders are likely to be relevant to stakeholders in other states in the U.S. West, although differences will exist. Implementation of these recommendations is conditional on the federal regulatory environment and illustrates where Colorado stakeholders see areas for federal policies to evolve in the future.

Overall, the items summarized in this article should provide insight to other economic professionals on key issues across the complete industrial hemp supply chain. Throughout the stakeholder meetings, and as seen in the recommendations outlined in this report, data and standardized information are a common theme. Future research in this area should focus on providing experts and stakeholders with the information they need to make educated and forward-thinking policy and planning decisions.

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