Marijuana Appellations: The Case for Cannabicultural Designations of Origin

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Introduction

When California Governor Jerry Brown signed the Medical Marijuana Regulation and Safety Act (MMRSA) into law in October of 2015, the bill was hailed as the first step towards putting into place a regulatory framework for marijuana agriculture.[1] Although the state had legalized medical marijuana in 1996,[2] there had been little to no effort to regulate the industry in any way, particularly its many farmers. The MMRSA was a step in the right direction in many ways, not least of which was to prepare for the prospect of full-blown recreational use legalization in 2016. The MMRSA comprehensively tasked state agencies with creating regulatory frameworks for several key issues facing the marijuana industry, including licensing, product tracking, labeling, pesticide use, and environmental impacts.[3]

Buried deep in the text of the MMRSA is a provision that would allow the newly-established Bureau of Medical Marijuana Regulation to profoundly shape the nature and direction of the marijuana industry: "The bureau may establish appellations of origin for marijuana grown in California."[4] Even if the Bureau does not establish marijuana appellations, the MMRSA prohibits the use of California county names in the marketing, labeling, or sale of marijuana products unless the marijuana was grown in that county.[5]

An appellation is a certified designation of origin that may also require that certain quality or stylistic standards be met.[6] Appellations are most com-

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[1] MMRSA, Cal. Stat. SB 643 (codified as amended in scattered sections of the Cal. Bus. & Prof. Code); *see also Assembly Members Urge Governor Brown to Sign Medical Marijuana Package*, News Channel 3, http://kiem-tv.com/video/assemblymembers-urge-governor-brown-sign-medical-marijuana-package [https://perma.cc/K4D7-WY6L] (quoting Jim Wood, 2nd Assembly District stating that "cultivators are going to have to comply with the same kinds of regulations that typical farmers do . . . . [I]t's going to be treated like an agriculture product").

[2] Cal. Health & Safety Code § 11362.5 (West, Westlaw through all 2016 Reg. Sess. laws, Ch. 8 of 2015–2016 2nd Ex. Sess., and all propositions on 2016 ballot (1996)).

[3] S.B. 643 §§ 19332(a)–(e).

[4] S.B. 643 § 19332.5(b).

[5] S.B. 643 § 19332.5(d).

[6] In the wine industry, for example, the appellation system in the United States is only concerned with geography, while the European Union's appellations typically require more stringent standards be met. *See generally* Warren Moran, *The Wine Appellation as Territory in France and California*, 83 Annals Ass'n Am. Geographers 694 (1993) (comparing appella-

monly associated with the wine industry, but they can be applied to any agricultural product for which the geographic origin carries importance. The MMRSA provision, although seemingly innocuous, may have far-ranging effects on the marijuana industry in the United States. As the most populous state in the Union and the most prolific marijuana producer,[7] California is likely to dictate, or at least influence, how, where, and by whom marijuana is grown. Already, there is evidence in California that grassroots efforts are underway to establish local designations of origin for marijuana agriculture.[8]

If the marijuana industry (or even California) were to adopt the appellation model, it would throw cold water on prevailing assumptions that marijuana will become an agricultural commodity in a post-prohibition world. The demise of the small-scale marijuana farmer is a common narrative of marijuana legalization discourse. States across the country are legalizing the medicinal or recreational use of marijuana, and rapid legalization is sure to cause an increase in demand. According to this narrative, it is inevitable that the marijuana industry will consolidate into a handful of agricultural conglomerates producing vast quantities of indistinct marijuana.[9] As it becomes an agricultural commodity, the market will be flooded with cheap marijuana, driving down prices and driving out small-scale farmers.

The narrative is compelling, but misguided. This article argues that commoditization and consolidation of the marijuana industry is not inevitable (or even likely), and that marijuana appellations, or American Cannabicultural Areas (ACAs), offer a more promising alternative to farmers,

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tion systems in France and California); David E. R. Gay & Ralph B. Hutchinson, *A Comparative Analysis of French and U.S. Wine Appellations*, 15 ATLANTIC ECON. J. 99 (1987).

[7] California currently has approximately fifty thousand marijuana farms accounting for sixty percent of all marijuana grown in the United States. *See* Alissa Walker, *How Growing More Weed Can Help California Fix its Water Problems*, GIZMODO (Oct. 12, 2015), http://gizmodo.com/how-growing-more-weed-can-help-california-fix-its-water-1732169259 [https://perma.cc/C8QF-QQUT].

[8] *See* Cynthia Sweeney, *Mendocino County Divided into Cannabis Appellations*, NORTH BAY BUS. J. (June 13, 2016), http://www.northbaybusinessjournal.com/newhome/5702907-181/mendocino-cannabis-appellations?artslide=0 [https://perma.cc/EHH5-GMW3]; Keith Mansur, *Cannabis Appellation Regions for Oregon*, OR. CANNABIS CONNECTION (July 22, 2016), https://olis.leg.state.or.us/liz/2015R1/Downloads/CommitteeMeetingDocument/78941 [https://perma.cc/Q97P-7VKA].

[9] *See Reeferegulatory Challenge*, ECONOMIST (Feb. 13, 2016), http://www.economist.com/news/briefing/21692873-growing-number-countries-are-deciding-ditch-prohibition-what-comes [https://perma.cc/B9FD-VE66] (claiming that "big companies are likely to emerge," with "[b]ig farms supplying a national market" despite acknowledging that no big alcohol or tobacco firms had an interest in the marijuana industry); *Former White House Drug Adviser Fears "Big Marijuana,"* FUSION (Dec. 18, 2013), http://fusion.net/story/4492/former-white-house-drug-advisor-fears-big-marijuana/ [https://perma.cc/8XBS-WNGC] (citing the claim by former President Obama's advisor on drug control policy that America was "on the brink of creating . . . big marijuana"); Tony Dokoupil, *Vice Wars: Tobacco, Alcohol and the Rise of Big Marijuana*, NBC NEWS (Nov. 29, 2014), http://www.nbcnews.com/storyline/legal-pot/vice-wars-tobacco-alcohol-rise-big-marijuana-n253801 [https://perma.cc/92MH-6K3W] (describing a 2014 marijuana expo that held a panel on the industry's corporate future titled, "The Pending Invasion").

regulators, and consumers.[10] The early history of marijuana legalization suggests that the potential for marijuana farming to remain a small-scale vocation is strong. To begin with, the market is already dominated by small-scale farms—there are an estimated fifty thousand marijuana farms in California alone.[11] While legalization will no doubt disrupt the industry and create new market participants, it is unlikely that these farms will submit to the "Big Marijuana" narrative. On the contrary, many of the earliest states to legalize marijuana cultivation have placed severe restrictions on cultivation areas.[12] In addition, the market for marijuana products is subdivided into an incredible number of marijuana strains, each of which produces its own effects and flavor profile. As the industry continues to create unique and differentiated strains, the prospect of marijuana becoming an agricultural commodity may be increasingly unlikely.

Some regions are already experimenting with marijuana appellations, and while challenges to widespread adoption are significant, a marijuana appellation model has promise. On the other hand, there may be a role for large-scale cultivation and distribution of hemp, a derivative of cannabis plants that is used for industrial products instead of direct human consumption. Whether this duality becomes the norm, commoditization and consolidation is not inevitable. Marijuana appellations have significant regulatory potential and represent a more local and sustainable agricultural model for the marijuana industry.

This article presents the case for ACAs. Part I introduces basic principles of agricultural organization and protectionism, including commoditization, consolidation, and designations of origin. Part II argues that commoditization of marijuana agriculture—in which the market is flooded with large quantities of generic marijuana—faces several agricultural and regulatory challenges. In Part III, an alternative regulatory and organizational model for the marijuana industry—American Cannabicultural Areas—is proposed and examined, with costs and benefits for farmers, regulators, and consumers in mind. Finally, Part IV considers the potential for parallel cannabis markets, allowing industrial hemp and artisanal marijuana to co-exist. Challenges to the proposals made in this article are significant but not intractable. The legal marijuana industry is still in its infancy, but ACAs represent a promising regulatory model for marijuana agriculture.

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[10] This article departs from, and builds on, the author's previous research on marijuana agriculture regulation. *See* Ryan B. Stoa, *Weed and Water Law: Regulating Legal Marijuana*, 67 HASTINGS L.J. 565 (2016); Ryan B. Stoa, *Marijuana Agriculture Law: Regulation at the Root of an Industry*, FLA. L. REV. (forthcoming 2017).

[11] *See* Walker, *supra* note 7.

[12] Oregon has explicitly tiered production limitations for batch and canopy size. OR. ADMIN. R. 845-025-2040 (West, Westlaw through rules published in Oregon Bulletin Volume 56, No. 1, Jan. 1, 2017 (2016)).

I. The Basics of Agricultural Commoditization, Consolidation, and Designations of Origin

The economic and regulatory market for an agricultural product can take many different forms. The cultivation of the agricultural product can be undertaken by many small farms or a few very large farms. The product can become a commodity, bought and sold in bulk as an indistinct good, or the product can be sold as a unique good with distinct characteristics. To determine which agricultural model is ideal for the marijuana industry, it is appropriate to note the conditions necessary for each. These models are not mutually exclusive, of course, and the marijuana industry may eventually exhibit overlapping features. But the basics of commoditization, consolidation, and appellations or designations of origin shed light on their future viability for marijuana agriculture.

Agricultural commodities are agricultural products that have no qualitative differentiation in the marketplace. They are fungible and treated equally with little regard for where, how, or by whom they were produced. As Karl Marx wrote, "From the taste of wheat it is not possible to tell who produced it, a Russian serf, a French peasant or an English capitalist."[13] Commodities are not differentiated by brand, quality (or perceived quality), or the sustainability of production. Besides wheat, other examples include tobacco, rye, barley, oats, cotton, soybeans, and rice.[14] The commoditization of agricultural products allows them to be mass-produced and widely available, increasing supply and driving down prices for consumers.[15] On the other hand, by making products uniform, commoditization makes it difficult for producers and consumers to create a market for unique products.[16]

The transition from differentiated product to undifferentiated product is not black and white, as some products retain niche markets with unique characteristics, and regulations can intervene to create unique markets or prevent products from becoming absolute commodities. Eggs, for example, may be somewhere in the middle: some consumers view them as fungible and reach for the cheapest eggs available,[17] while other consumers pay more

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[13] Karl Marx, *A Contribution to the Critique of Political Economy*, *in* 29 Collected Works of Karl Marx and Frederick Engels 257, 270 (Progress Publishers Moscow 1st ed. 1986).

[14] "Agricultural Commodity" Defined, 7 U.S.C. § 1518 (2012).

[15] *See Commoditize*, Investopedia, http://www.investopedia.com/terms/c/commoditize.asp [https://perma.cc/LM42-RJ8X].

[16] *See* Martin Rapaport, *Commoditization: Diamond Industry to Establish Fair, Open, Competitive Markets*, Rapaport Mag. (July 1, 2007), https://member.rapnet.com/news/PrintArticle.aspx?ArticleID=18283&ShowArticle=TWv8CjQRFseddSJP%2bPDK%2bws2zDC0Gk6d [https://perma.cc/TVS2-GDFL].

[17] *See US Egg Farm Price Received*, YCharts, https://ycharts.com/indicators/us_egg_price [https://perma.cc/C28M-GYS4].

for eggs produced sustainably or ethically.[18] States can create parallel markets by establishing regulations that impose certain requirements on otherwise fungible products. California, for example, requires all eggs sold in the state to be laid by hens raised in adequately large pens.[19] In the most aggressive cases, jurisdictions create appellations for agricultural products (such as wine or cheese), providing a protected indication based on where or how the product was created.[20]

The conventional wisdom is that absent regulation, the marijuana industry will come to be dominated by large-scale, mass-produced marijuana farms that flood the market with marijuana and drive down prices.[21] As prices drop, small-scale farming will become unprofitable, leading to consolidation of the industry into fewer farms cultivating larger quantities of marijuana. Thus, commoditization of marijuana is often linked with a concomitant process of market consolidation. Strictly speaking, it is wrong to assume that commoditization will necessarily lead to consolidation, or that consolidation can only take place if marijuana becomes an agricultural commodity. The processes are linked but not mutually interdependent. Nonetheless, market observers have expressed a strong sentiment that the commoditization of marijuana is likely, and with it agricultural consolidation will soon follow.[22]

The U.S. tobacco farming industry has experienced a similar process over the past several decades. While tobacco farms have traditionally been relatively small due to the labor-intensive nature of tobacco cultivation, aggregation-friendly policies and the emergence of labor-reducing technologies have led to a dramatic decline in the number of tobacco farms, in tandem with an increase in tobacco acreage per farm.[23] The trend toward fewer larger farms has made it easier for the industry as a whole to consolidate as well.[24]

Left unchecked, the marijuana industry may consolidate in similar fashion. There is evidence that consolidation is already taking place within states,[25] but the truly disruptive force would be federal marijuana legaliza-

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[18] *See* Dan Charles, *Most U.S. Egg Producers Are Now Choosing Cage-Free Houses*, NAT'L PUB. RADIO: THE SALT (Jan. 15, 2016), http://www.npr.org/sections/thesalt/2016/01/15/463190984/most-new-hen-houses-are-now-cage-free [https://perma.cc/59WY-VNJT].

[19] *See* Shruti Date Singh & Lydia Mulvany, *Egg Markets Disrupted in the U.S. as Cages Made Roomier*, BLOOMBERG BUS. (Dec. 13, 2014), https://www.bloomberg.com/news/articles/2014-12-12/egg-market-disrupted-by-bigger-cages-boosting-price-commodities [https://perma.cc/6SKL-VJ7T].

[20] *See, e.g.*, Appellations of Origin, 27 C.F.R. § 4.25 (2012).

[21] *See Reeferegulatory Challenge*, *supra* note 9.

[22] *Id.*

[23] *See generally* TOM CAPEHART, U.S. DEP'T OF AGRIC., TBS-257-02, TRENDS IN U.S. TOBACCO FARMING (2004) (describing the trend in U.S. tobacco farming toward fewer and larger farms).

[24] *See* Ross Hammond, *Consolidation in the Tobacco Industry*, 7 TOBACCO CONTROL 426 (1998).

[25] *See, e.g.*, John Maxfield, *The Making of Colorado's Marijuana Millionaires*, MOTLEY FOOL (Jan. 4, 2014), https://www.fool.com/investing/general/2014/01/04/the-making-of-

tion that permits interstate marijuana commerce. As explained further below, the federal government's enforcement focus on interstate commerce of marijuana, paired with a relatively permissive stance toward purely intrastate marijuana commerce, has supported the emergence of local cultivators of marijuana in each legal jurisdiction.[26] Absent regulation, the fall of those jurisdictional barriers along state lines should therefore facilitate consolidation.

Appellations have been mentioned as a potential obstacle to commoditization and consolidation of marijuana. An appellation is a certified designation of origin that may also require certain quality or stylistic standards be met.[27] Appellations are most commonly associated with the wine industry, but they can be applied to any agricultural product for which the geographic origin carries importance. The wine industry's model rests on the assumption that environmental conditions (soil, aridity, temperature, etc., collectively known as the "terroir") influence grape quality, and there is general agreement that this assumption has merit.[28]

Designation requirements can also have quality standards, and these tend to increase the quality of grapes grown in the appellation, improving wine quality and the region's reputation.[29] Generally speaking, appellations in the United States do not have stringent cultivation rules, and speak more to the geographic origin of the product than to the product's quality. American wine appellations, composed of states, counties, or American Viticultural Areas (AVAs), are regulated by the Treasury Department's Alcohol and Tobacco Tax and Trade Bureau (TTB).[30] The AVA model requires only that wines using an appellation designation come from that appellation region.[31] American appellation designations do not speak to the quality of the wine. This is in contrast to the French appellation model, among others, in which the appellation designation is only allowed if stringent cultivation rules and regulations are followed, ensuring that wines carrying appellation designa-

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colorados-marijuana-millionaires.aspx [https://perma.cc/583P-VP9B]; John Ingold, *Colorado Medical-Marijuana Businesses Have Declined by 40 Percent*, Denver Post (Mar. 2, 2013), http://www.denverpost.com/2013/03/02/colorado-medical-marijuana-businesses-have-declined-by-40-percent/ [https://perma.cc/C4FS-3XHC].

[26] *See infra* note 53 (outlining the U.S. Department of Justice's marijuana enforcement priorities, which includes interstate transport and sale of marijuana, while diverting the focus away from state-legal cultivation).

[27] *See* Moran, *supra* note 6; Gay & Hutchinson, *supra* note 6.

[28] *See* Michael Maher, *On* Vino Veritas*? Clarifying the Use of Geographic References on American Wine Labels*, 89 Calif. L. Rev. 1881, 1884 (2001).

[29] *See* Jancis Robinson, Oxford Companion to Wine 322 (Oxford Univ. Press 3rd ed. 1994).

[30] 27 C.F.R. § 4.25 (2012).

[31] *See, e.g.*, *Wine Appellations of Origin*, U.S. Dep't Treasury, Alcohol & Tobacco Tax & Trade Bureau (last updated Oct. 5, 2016), https://www.ttb.gov/appellation/#requirement [https://perma.cc/6FLM-ESZU] (stating that for states and counties, not less than seventy-five percent of the volume of the wine is derived from grapes grown in the labeled appellation, and in AVAs, not less than eighty-five percent).

tions meet high quality standards.[32] There are trade-offs characteristic to both systems. The French model provides quality assurance at the cost of agricultural freedom. The U.S. model, by contrast, fosters innovation but fails to convey any non-geographic information.

In either case, as the reputation of a region's agricultural product grows, the appellation designation creates a unique market for the product, increasing prices while precluding other producers from associating their products with the region.[33] Appellations therefore create mandatory differentiation in the market, frustrating efforts to commoditize the industry. This can be beneficial to local economies that are threatened by the influx of cheap permutations of their products. Champagne, France, for example, is a prosperous sparkling wine producing region because its designation of origin differentiates and protects its Champagne producers from sparkling wine imitators. In fact, the Champagne region's economic protectionism efforts were partly responsible for the advent of the French appellation system in the first place.[34]

Protectionism of local industries and their brands has a secondary benefit: by certifying that products with geographic indicators are accurately designated, appellations assure consumers of authenticity. Continuing with the Champagne example, when the region experienced crop failures in 1890, fraudulent producers from other regions attempted to replace the resulting drop in supply by selling lower quality wine and passing it off as Champagne.[35] This harmed real Champagne producers, of course, but consumers suffered as well by paying inflated prices for a low quality product. AVAs assure consumers of American wine that the wine they are purchasing actually originates from where it claims to. In other appellation systems with more rigorous cultivation requirements, the designations can communicate information about the product's quality, rarity, or sustainability standards.[36]

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[32] *See* Alyson M. Chouinard, *Wine Appellation Regulation in the U.S. and France as a Response to Globalization*, INQUIRIES J. (2011), http://www.inquiriesjournal.com/articles/360/wine-appellation-regulation-in-the-us-and-france-as-a-response-to-globalization [https://perma.cc/833X-NLCF].

[33] Of course, the model also fosters fraud as lesser or outside cultivators attempt to claim a region as their own, or simply confuse the consumer. *See* Jay Kiiha, *Trade Protectionism of Wine Brand Names at the Expense of American Viticultural Areas: Arbitrary Protection of "Big Liquor" at the Expense of Small Vineyards*, 9 DRAKE J. AGRIC. L. 157, 159 (2004).

[34] *See* Mike Veseth, *How Champagne Changed the Global Economy*, FORTUNE MAG. (Aug. 4, 2015), http://fortune.com/2015/08/04/money-taste-wine-veseth/ [https://perma.cc/AZJ2-C4GT] ("The appellation system was a defensive mechanism, meant to ward off foreign foes and domestic saboteurs, and it is perhaps not surprising how quickly the idea spread at a time when economic threats were seemingly numberless and promises of security particularly precious.").

[35] *See generally* MIKE VESETH, MONEY, TASTE & WINE—IT'S COMPLICATED! (Rowman & Littlefield 1st ed. 2015) (describing the rise of counterfeit Champagne production in the absence of legitimate producers).

[36] The French appellation responsible for regulating the production of Comté cheese, for example, has "used the production specifications to reduce concentration (of the *fruitières* and the farms), to maintain the quality of the cheese, and to preserve the traditional production methods." Amy B. Trubek & Sarah Bowen, *Creating the Taste of Place in the United States: Can We Learn from the French?*, 73 GEOJOURNAL 23, 26 (2008).

These twin goals of providing economic benefits (by promoting rural development) and consumer protection (by conveying information and authenticity) underlie the basic motivations of most appellation systems.[37] There are drawbacks to appellation systems, naturally. Most obvious are the administrative costs of imposing a regulatory system on agricultural products that could be cultivated, marketed, sold, and consumed without any reference to the place of origin. The French appellation system, for example, is notoriously bureaucratic, requiring producers to collectively develop and enforce a unique set of cultivation standards.[38] Despite these costs, however, the thoughtful development of bottom-up cultivation standards offers tangible benefits in itself. The process of establishing and maintaining appellations brings agricultural producers and stakeholders together to negotiate or address regional issues, and there is evidence that appellations promote more sustainable and ecologically-responsive practices.[39]

Agricultural commodities can co-exist alongside origin-designated products, as consumers demand goods in a variety of formats and permutations. Nonetheless, the marijuana industry may come to favor one approach or another, as a result of either market dynamics or proactive regulations. In theory, the marijuana industry's stakeholders (including farmers, regulators, and consumers) could embrace commoditization and consolidation of cultivation, prioritizing the provision of cheap and plentiful marijuana.[40] Stakeholders could, alternatively, reject that approach in favor of a marijuana appellation system that encourages the development of diverse farming regions and high-quality products. One advocate of marijuana legalization who embraces an unregulated approach to marijuana agriculture claims marijuana consumers want the best product at the lowest cost.[41] Unfortunately, it will be difficult for consumers to have it both ways. The discussion that follows assesses the suitability of each agricultural model for the marijuana industry.

II. Marijuana's Challenging Path to Agricultural Commoditization

There may be a presumption that marijuana, once fully legalized, will be grown in vast quantities by a few large-scale producers. In some circles, the commoditization and consolidation of the marijuana industry is seen as

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[37] *See* Maher, *supra* note 28, at 1885–86.

[38] *See* Elizabeth Barham, *Translating Terroir: The Global Challenge of French AOC Labeling*, 19 J. Rural Stud. 127, 133 (2003).

[39] *See id.* at 134–35.

[40] *See* Dokoupil, *supra* note 9.

[41] *Id.* (quoting Allen St. Pierre, the executive director of NORML, "What do we want? We can get it down to four words, almost a Wal-Mart bumper sticker: 'Best product, lowest cost.'").

inevitable, a simple matter of free-market economics.[42] However, there is emerging evidence that commoditization and consolidation will be challenging. First, marijuana's botanical characteristics foster the development and cultivation of unique plant varieties, making it difficult to create a single marijuana commodity in the first place. Second, the incremental, state-by-state legalization process is setting in motion a hyper-localized approach to marijuana agriculture regulation that frustrates consolidation and promotes local markets.

Marijuana's botanical characteristics suggest that commoditization and consolidation of marijuana farms is not inevitable even in an unregulated environment. While marijuana is typically described as a uniform product, in reality, the industry cultivates hundreds of unique "strains" of marijuana.[43] The strains vary in appearance, texture, smell, taste, and effect. Some have been bred to maximize tetrahydrocannabinol (or "THC," the chemical principally responsible for producing psychoactive effects) in order to produce a stronger high.[44] The rise of the medical marijuana market, meanwhile, has prompted farmers to grow strands that minimize THC while maximizing cannabidiol (or "CBD," a chemical believed to have a variety of medical applications).[45] In addition, some strains have become de facto branded, while others denote a geographic place of origin. Many of these strains are challenging to grow and labor-intensive, thwarting efforts to mass-produce them.

Patent law may create additional hurdles for commoditization. The one-year on-sale rule of patent law would likely preclude existing strains from being proprietary,[46] and generic cultivation signals a move toward commoditization. But farmers may be able to patent new marijuana strains in the future,[47] and the experimentation and patenting of future strains may leave room for innovative breeders and intrepid farmers to continue providing unique products that frustrate the commoditization of marijuana.

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[42] *See Reeferegulatory Challenge*, *supra* note 9.

[43] *See generally* Jason Sawler et al., *The Genetic Structure of Marijuana and Hemp*, 10 PLOS ONE 1371 (2015) (explaining that the cannabis plant can be grown to produce a remarkable variety of unique strains).

[44] *See* T. Kid, *The Quest to Grow the World's Most Powerful Pot*, VICE NEWS (Apr. 20, 2015), https://www.vice.com/en_us/article/marijuanas-growers-are-upping-the-thc-ante-with-super-potent-pot-456 [https://perma.cc/PJ9B-NF8C].

[45] *See* Sarah Jacoby, *Why THC Isn't the Only Thing in Weed that Matters*, REFINERY29 (Aug. 26, 2015), http://www.refinery29.com/2015/08/92201/cbd-medical-marijuana-facts#.7i9f2t:fDGW [https://perma.cc/DP9C-MEUA]; *Part 3, The Rapid Rise in CBD Interest*, LEAFLY MARKETWATCH (Dec. 2, 2015), https://www.leafly.com/news/industry/leafly-marketwatch-the-rapid-rise-in-cbd-interest [https://perma.cc/T4VA-AHCZ].

[46] *See* Conditions for Patentability; Novelty, 35 U.S.C. § 102(b) (2015); Pfaff v. Wells Elecs., Inc., 525 U.S. 55, 57 (1998).

[47] *See* Jonathan M. Purow, *Planting the Seeds for IP Protection of Marijuana Brands*, LAW 360 (Dec. 22, 2015), https://www.law360.com/articles/733611/planting-the-seeds-for-ip-protection-of-marijuana-brands [https://perma.cc/HT78-CP4E]; Hilary Bricken, *The Possibility of Marijuana Plant Patents*, ABOVE THE LAW (July 6, 2015), http://abovethelaw.com/2015/07/the-possibility-of-marijuana-plant-patents/?rf=1 [https://perma.cc/7579-DZUG].

Recalling that commoditization lies on a spectrum, one can accept that the industry will accommodate large-scale farming methods while leaving room for small-scale farming and unique specializations. As discussed in Part IV below, hemp strains (used to make non-psychoactive marijuana products such as textiles or paper) appear to fit the mold of an agricultural commodity, for example. And even if marijuana strains are commoditized and widely distributed, the market could support local artisanal cultivation in much the same way that beer consumers allow craft microbreweries to compete in a market dominated by international breweries producing inexpensive beers.[48] Marijuana farmers may be able to tap into those same demands for locally-produced, innovative products.

The potential for parallel marijuana markets notwithstanding, many states have shown an inclination toward protectionism in the marijuana industry that further distances the possibility of commoditization and consolidation. In New Mexico, for example, state law requires that medical marijuana sold to patients be grown in New Mexico, preventing out-of-state cultivators from flooding the New Mexico market with generic marijuana.[49] Attempts to acquire marijuana businesses by out-of-state or out-of-country companies have also been met with public backlash.[50] Washington has stringent residency requirements for marijuana license holders.[51] Colorado has enacted similarly protective policies.[52]

Marijuana import bans and residency requirements may be driven more by federalism than protectionism. Interstate distribution of marijuana falls more clearly under the province of federal regulation, and the Justice Department has articulated enforcement priorities under the Controlled Substances Act that include interstate marijuana commerce.[53] As states are given more autonomy with respect to marijuana policy, some have begun loosening their residency requirements. Oregon, for example, eliminated its two-year residency requirement for cultivators in March 2016.[54] But even if the federal prohibition is lifted and these protectionist policies are eventually weakened or repealed, they are nonetheless setting precedent and expectations. And

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[48] Research into the rise of microbreweries notes an increase in the consumer demand for locally-produced and unique products. *See, e.g.*, Wes Flack, *American Microbreweries and Neolocalism: "Ale-ing" for a Sense of Place*, 16 J. CULTURAL GEOGRAPHY 37 (1997); Steven M. Schnell & Joseph F. Reese, *Microbreweries, Place, and Identity in the United States*, *in* THE GEOGRAPHY OF BEER: REGIONS, ENVIRONMENT, AND SOCIETIES 167 (Mark Patterson & Nancy Hoalst-Pullen eds., 2014).

[49] *See* Joey Peters, *Consolidating and Cashing in on Medical Marijuana*, NM POL. REP. (May 8, 2015), http://nmpoliticalreport.com/3522/consolidating-and-cashing-in-on-medical-marijuana/ [http://perma.cc/K4NZ-A9L5].

[50] *See id*.

[51] WASH. ADMIN. CODE § 314-55-020 (West, Westlaw through the 17-01 Washington State Register dated, Jan. 4, 2017 (2016)).

[52] *See* Maxfield, *supra* note 25.

[53] *See* Memorandum from James M. Cole, Deputy Att'y Gen., to U.S. Attorneys, Guidance Regarding Marijuana Enforcement (Aug. 29, 2013), http://www.justice.gov/iso/opa/resources/305201382913275685746 7.pdf [https://perma.cc/H3RU-QRXJ].

[54] Act of Mar. 3, 2016, ch. 24, 2016 Or. Laws 475B.070(1)(2)(b).

perhaps more importantly, these policies are creating distinct state industries whose interests may be politically difficult to ignore. At the same time that it repealed its residency requirement, for example, Oregon also reduced administrative requirements on small-scale marijuana farmers,[55] a sign that the state intends to protect the interests of its diverse marijuana farming community.[56]

In jurisdictions where marijuana cultivation is economically significant or even dominant—such as Humboldt, Mendocino, and Trinity counties in northern California—policymakers will receive significant pressure to avoid commoditization and consolidation of the industry. In particular, early-adopting states that are taking on the risk of legalization may want to ensure the benefits stay in-state. It is fairly unique that a state would require an agricultural product be grown in the state or impose residency requirements on cultivators, but given the unique nature of the state-by-state history of marijuana legalization, it is not inconceivable that regulations will be designed to prevent fluid commerce and consolidation of cultivation.

While there are signs that state regulatory frameworks for marijuana are working against the commoditization and consolidation of marijuana agriculture, other states are regulating the marijuana industry in ways that may be facilitating commoditization and consolidation, even if that is not the primary purpose of the regulation. In order to make oversight of this new industry more manageable, some states have mandated vertical integration of the supply chain, while others limit the regulatory burden by limiting cultivation to state-sanctioned conglomerates. Both kinds of regulation have implications for the way marijuana agriculture will be organized in the future.

In states where vertical integration is required, marijuana farmers must sell what they grow, and dispensaries must grow what they sell.[57] For regulators, the advantage of vertical integration is that it reduces the number of marijuana businesses in operation and makes it easier to track the supply chain from seed to sale. There are advantages for marijuana businesses as well. Vertical integration increases profit margins by reducing the number of

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[55] Act of Mar. 3, 2016, ch. 23, 2016 Or. Laws 475B.063(2)(5).

[56] *See infra* notes 61–63.

[57] Vertical integration is mandatory in Maine, Massachusetts, New Hampshire, New Jersey, and New Mexico. 10-144-122 ME. CODE R. § 6.4.1.1.2 (LEXIS through Jan. 30, 2017) (LexisNexis 2017) (dictating the amount of marijuana a dispensary is permitted to grow); 105 MASS. CODE REGS. 725.105 (West, Westlaw through Jan. 13, 2017 (2016)); Act of July 23, 2013, ch. 242, N.H. REV. STAT. ANN. § 126-X:1 (West, Westlaw through Chapter 330 (End) of the 2016 Reg. Sess., not including changes and corrections made by the State of New Hampshire, Office of Legislative Services (2016)) (listing acceptable activities for alternative treatment centers, and not including purchase); N.J. STAT. ANN. § 24:6I-7 (West, Westlaw current with laws effective through L.2017, J.R. No. 1. (2013)) (permitting approved alternative treatment centers to cultivate, grow, harvest and sell their own marijuana); N.M. CODE R. § 7.34.4.8(A)(2) (LEXIS through New Mexico Register, Vol. XXVII, No. 24 dated Dec. 30, 2016 (LexisNexis 2017)) (focusing on the amount of plants a non-profit producer is permitted to grow, but allowing for usable cannabis trade from other licensed producers); *see also* COMMONWEALTH OF MASS., MEDICAL USE OF MARIJUANA PROGRAM, GUIDANCE FOR MUNICIPALITIES REGARDING THE MEDICAL USE OF MARIJUANA 2 (2016).

profit-seeking firms in the supply chain, while allowing for more control over inventory. Vertically-integrated businesses may also cut down on redundant business expenses.

On the other hand, it is significantly more expensive to finance a business that incorporates the cultivation, post-production, and retail sale of marijuana. In part because of the increased expertise needed to handle a diversity of marijuana business activities, some estimates suggest that it can be three to ten times more expensive to establish a vertically-integrated marijuana business than a retail dispensary.[58] These factors may increase market consolidation. The financial and human resources needed to establish an integrated marijuana business and navigate each supply chain component's regulatory requirements may create such a high barrier to entry that small-scale farmers are shut out, leaving only a select few capital-rich businesses to dominate the market. In the early years of Colorado's medical marijuana market, when vertical integration was required, the regulatory requirements were so onerous that over a third of operators went out of business.[59]

States have also limited their regulatory burdens by severely restricting permits for marijuana cultivation. In fact, several states have considered regulations that would limit marijuana farming to a select group of large-scale operators. These consolidation-by-design proposals would not allow a small-scale marijuana farming culture to take root in the first place. While California struggles to regulate tens of thousands of marijuana farms, states like Florida,[60] New York,[61] and Ohio[62] strictly limit cultivation licenses. This approach allows the state to carefully select responsible cultivators, makes it easy to monitor cultivation, and buys time before presumably shifting to a more expansive model. With so few cultivators, states can lavish regulatory attention on the licensees to ensure compliance, or craft site-specific rules depending on the needs and cultivation infrastructure of the operation.[63]

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[58] Whit Richardson, *Pros and Cons of Vertical Integration*, MEDIUM (Mar. 14, 2017), https://medium.com/4front-advisors/pros-and-cons-of-vertical-integration-3ce4bbed7572#.ljnbpj4dn [https://perma.cc/9STC-MZ2N].

[59] *See* Ingold, *supra* note 25; Tim Sprinkle, *For Cannabis Entrepreneurs, Industry Expansion Brings Growing Pains*, YAHOO FIN. (Mar. 11, 2013), http://finance.yahoo.com/news/marijuana-industry-faces-growing-pains-amid-consolidation—growth-214432335.html [http://perma.cc/YA9S-N3QD].

[60] S.B. 1030, 2014 Leg., Reg. Sess. (Fla. 2014).

[61] 2014 N.Y. Sess. Laws A. 6357-E § 3365(9) (McKinney); *see also* Catherine Rafter, *New York State Just Granted Five Medical Marijuana Licenses*, OBSERVER NEWS (July 31, 2015), http://observer.com/2015/07/new-york-state-just-granted-five-medical-marijuana-licenses/ [http://perma.cc/TS3S-8CX3].

[62] Number of cultivator provisional licenses, Medical Marijuana Control Program, 3796:2-1-01 (revised Mar. 22, 2017).

[63] In principle, states can tailor any number of water or agricultural permits. However, there is a limit to how extensive the specifications can be when administering large volumes of permit applications. *See generally* Gary D. Lynne, J. S. Shonkwiler & Michael E. Wilson, *Water Permitting Behavior Under the 1972 Florida Water Resources Act*, 67 LAND ECON. 340 (1991) (discussing the trade-offs of comprehensive permitting schemes in Florida).

Limiting cultivation licenses to a handful of businesses promotes agricultural consolidation by prohibiting fragmentation of the market in the first place. Marijuana produced in these states is also more likely to fit the mold of an agricultural commodity, as there will be fewer farmers cultivating and experimenting with unique strains and products. Drastically limiting cultivation is not likely to be a long-term solution, however. There is evidence that limiting cultivation to politically connected conglomerates lacks public support.[64] Even if the state transitions to a more permissive model, the previously licensed cultivators will have a government-given leg up that stifles competition. And while the state may have developed the capacity to create site-specific regulations under the restrictive model, those capacities would be less relevant when cultivation proliferates and a more comprehensive regulatory approach is needed.

Furthermore, with legalization efforts gaining momentum and spreading knowledge on cultivation methods, it seems unlikely that marijuana cultivation will remain dormant for long, even in states where small-scale marijuana farming is not well-established.[65] Limiting cultivation of marijuana to a select group of businesses may reduce states' oversight burdens and temporarily facilitate the commoditization and consolidation of marijuana agriculture. However, it does so at the risk of shutting out small-scale farmers from the regulatory system. The approach may create newfound enforcement challenges and is unlikely to be a long-term solution.

Contrary to popular opinion, it is not inevitable that marijuana will become an agricultural commodity. Nor is it inevitable that marijuana cultivation will consolidate into a few large-scale agricultural operations. Marijuana's botanical characteristics create distinct and unique strains that make commoditization elusive, while state policies—coupled with the ongoing federal marijuana prohibition—have established and protected local farming communities. Other policies have facilitated commoditization or consolidation, but are more than likely transition mechanisms as regulators adjust to a new industry. These dynamics call into question the inevitability of marijuana commoditization and consolidation before an alternative model for the marijuana industry is even proposed. The following part proposes one alternative.

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[64] For example, Ohio's 2015 constitutional amendment initiative to legalize marijuana included a list of landowners who would have had exclusive rights to cultivate marijuana in the state. The attempt to control the market prompted some legislators to introduce a constitutional amendment of their own that would prohibit the state's constitution from being used to create economic monopolies. Voters rejected the legalization monopoly initiative (which lacked support from some pro-legalization groups) while approving the anti-monopoly amendment. *See* H.R.J. Res. 4, 131st Oh. Gen. Assemb.; Matt Pearce, *Ohio Voters Soundly Reject Marijuana Legalization Initiative*, L.A. Times (Nov. 3, 2015), http://www.latimes.com/nation/la-na-ohio-marijuana-results-20151103-story.html [https://perma.cc/VT9R-Y4PU].

[65] The Drug Enforcement Administration (DEA) has described the shift in cultivation practices toward private lands as an obstacle to law enforcement and eradication. *See* U.S. Dep't of Justice, Drug Enforcement Admin., DEA-DCT-DIR-002-15, National Drug Threat Assessment Summary (2014).

III. The Promise of Marijuana Appellations: Toward American Cannabicultural Areas

There is strong evidence that appellations or designations of origin represent an appealing regulatory model for marijuana agriculture. The cultivation of marijuana differs according to environmental conditions and local custom, designations of origin facilitate transparency and consumer protection in an industry that has historically provided neither, and appellations can protect local economies and create unique products. Implementation and enforcement of marijuana appellations may be challenging in the absence of a federal regulatory program, but the decentralized nature of marijuana regulation provides an opportunity to establish cannabicultural areas through state and local lawmaking.

First, there is some merit to the claim that environmental conditions influence marijuana quality and would therefore provide a basis for place of origin designations. Marijuana farming has become so widespread in northern California in part because growing conditions there are ideal. While California is known for being an infamously arid state, in reality the problem is distributional: while almost all of its population is located to the south, most of the state's water resources were historically located north of Sacramento.[66] That is a problematic dynamic for population centers and the agricultural Central Valley, but it provides ample water resources for marijuana farming. As a double bonus, California's northern counties are dry during the summer growing season, when excess precipitation and humidity might dampen and spoil marijuana crops.[67]

In Jamaica, by contrast, marijuana farmers traditionally used genetic strains that were accustomed to tropical humidity and temperatures, cultivating marijuana with unique characteristics.[68] Seed companies regularly market their strains to match a diversity of outdoor conditions.[69] Instead of competing with each other to produce the most popular generic strains, ap-

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[66] Measurements taken between 1894 and 1947 showed the region north of Sacramento—including Mendocino, Trinity, and Humboldt counties—contained seventy-three percent of the state's water resources. *See* Gordon R. Miller, *Shaping California Water Law, 1781 to 1928*, 55 S. Cal. Q. 9, 9 (1973).

[67] This can create water allocation problems if water storage during fallow seasons is insufficient. *See* Scott Bauer et al., *Impacts of Surface Water Diversions for Marijuana Cultivation on Aquatic Habitat in Four Northwestern California Watersheds*, 10 Plos One 3, 3 (2015).

[68] While there are myriad problems with the Jamaican marijuana industry and little research on the subject, there is anecdotal evidence that indigenous strains are well adapted and can produce quality marijuana. *See* Pete Brady, *Ganja Gardens*, Cannabis Culture (Oct. 25, 2002), http://www.cannabisculture.com/content/2002/10/25/2412 [http://perma.cc/L2KG-QXYB].

[69] *See, e.g.*, *Outdoor Cannabis Seeds*, Sensi Seeds, https://sensiseeds.com/en/cannabis-seeds/outdoor;%20https:/sensiseeds.com/en/blog/choose-outdoor-cannabis-strain [http://perma.cc/2J36-BFPL]; *Cannabis Seeds for Cool Climate*, Barney's Farm Seeds, https://www.barneysfarmshop.com/barneys-farm-seeds/outdoor-cannabis-seeds/cool-climate.html [http://perma.cc/A7BU-5W4Q].

pellations allow regions to embrace the strains that grow well in their environment. For example, France's Burgundy and Northern Rhône regions are well-known for growing Pinot Noir and Syrah grape varietals, respectively.[70] Neither region is threatened by outside producers or forced to adopt ill-suited varietals because they have created individual markets for their own well-respected grapes. The same could be true of marijuana producing regions.

Conveying information about an agricultural product's origins provides some measure of consumer protection as well. This feature of marijuana appellation systems is particularly compelling given the industry's black market roots. Because marijuana has been (and in many jurisdictions continues to be) cultivated and sold on the black market, consumers have traditionally had little to no information regarding where or how their marijuana was grown. It is notoriously difficult to determine the origin of marijuana even in the aggregate,[71] but by one estimate two-thirds of marijuana consumed in the United States came from Mexico in 2008.[72] Given the well-publicized violence and corruption associated with Mexican drug cartels,[73] it is not unreasonable to believe consumer behavior would reflect a preference for domestically grown marijuana if geographic designations were reliable. In fact, there is evidence that legal marijuana cultivation in the United States is already driving "cartel grows" out of business.[74] Given marijuana's illicit dimensions in many jurisdictions where it remains prohibited, marijuana appellations can provide some assurance of authenticity and ethical cultivation. Appellations can assist the market in providing consumers with choices that meet their standards in similar fashion.

Appellations can provide consumers with more information than place of origin as well. The requirements common in French wine appellations mentioned above (e.g., restricting supply, eligible varietals, or alcohol content) not only collectively benefit the region's producers, but also provide that information about cultivation strategies to the consumer. Considering

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[70] *Main Grape Varieties by European Wine Region*, 1885 CONSULTING, https://1855consulting.com/news-articles/main-grape-varieties-by-european-wine-region/ [http://perma.cc/6HTX-LBY5].

[71] *See, e.g.*, Jon Gettman, *Lost Taxes and Other Costs of Marijuana Laws*, DRUG SCI. (2007), http://www.drugscience.org/Archive/bcr4/5Supply.html [http://perma.cc/9H2B-NTVT].

[72] Estimate is according to Beau Kilmer, co-director of the Drug Policy Research Center. *See* Deborah Bonello, *Mexican Marijuana Farmers See Profits Tumble as U.S. Loosens Laws*, L.A. TIMES (Dec. 30, 2015), http://www.latimes.com/world/mexico-americas/la-fg-mexico-marijuana-20151230-story.html [http://perma.cc/ZKN6-5ZAA]. Other estimates complicate the picture, claiming that by 2010, eighty percent of marijuana consumed in the United States came from California. *See* Brady, *supra* note 68.

[73] *See, e.g.*, William Neuman, *As Drug Kingpins Fall in Mexico, Cartels Fracture and Violence Surges*, N.Y. TIMES (Aug. 12, 2015), https://www.nytimes.com/2015/08/13/world/americas/as-mexico-arrests-kingpins-cartels-splinter-and-violence-spikes.html?_r=1 [http://perma.cc/WPY4-KJVB].

[74] *See* Bonello, *supra* note 72.

how many strains of marijuana are in existence, there is value in a regulatory framework that easily and reliably communicates important characteristics to consumers, such as the strain and its THC or CBD levels.

The economic incentive to provide monopolistic protections and marketing power to appellation regions is, without doubt, relevant to the marijuana industry. French wine appellations that require that vineyards only use certain varietals, limit irrigation practices that increase yields at the cost of grape quality, or attain a predetermined alcohol content do so in part to bolster the economic potential of the appellation region.[75] While these requirements make production more challenging, they collectively increase the region's overall product. Many of these practices could be applied to marijuana cultivation as well. Counties that have developed robust marijuana farming industries may feel that the influx of mass-produced generic marijuana that would come from national legalization may wipe out their existing small-scale farmers. Appellations can protect the brand-name associated with a region. An appellation system could ensure that only marijuana grown in Humboldt County, California carries with it the Humboldt County designation.[76] In addition, marijuana appellations can adopt specific standards that collectively enhance the quality and reputation of their region.

Of course, the adoption of appellations for the cultivation of marijuana would benefit from a broadly inclusive (i.e., transboundary) regulatory framework in order to maximize the impact of origin designations. The U.S. wine industry's appellations—American Viticultural Areas—are regulated by the federal TTB,[77] but for obvious reasons the TTB is unlikely to establish a national appellation system for marijuana if cultivation remains illegal under federal law. States can develop their own appellation frameworks, however, and as long as states maintain import/export bans (likely in the short-term given federal interstate commerce enforcement concerns), those state regulations may prove effective. State appellation regulations may even prove resilient if the federal prohibition is lifted and a federal agency regulates the industry. In *Bronco Wine Co. v. Jolly*, a more restrictive state wine labeling statute was not preempted by federal regulations.[78] State marijuana appellation regulations can be optimistic that, even if the federal government adopts a marijuana appellation framework, state laws will not become obsolete.

Nonetheless, it will be difficult for individual counties or local government bodies to enforce their own appellation designations if other jurisdictions do not follow suit. Enforcement of geographic indicators outside of the

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[75] *See* Daniel W. Gade, *Tradition, Territory, and Terroir in French Viniculture: Cassis, France, and Appellation Contrôlée*, 94 ANNALS ASS'N AM. GEOGRAPHERS 848, 852 (2004).

[76] California's 2015 MMRSA explicitly prohibits the inaccurate marketing, labeling, or sale of marijuana designations of origin. MMRSA, CAL. STAT. SB 643 § 19332.5(c) (West, Westlaw through all 2016 Reg. Sess. laws, Ch. 8 of 2015-2016 2nd Ex. Sess., and all propositions on 2016 ballot (2016)).

[77] 27 C.F.R. § 4.25 (2012).

[78] 95 P.3d 422, 425 (Cal. 2004).

regulatory body's jurisdiction is notoriously difficult. In one infamous case, it took fourteen years and a trade mission for the Napa Valley Vintners Association to convince the Chinese government to grant protected status to the term "Napa."[79] While the marijuana industry is increasingly mobilized and represented through interest groups,[80] it will be difficult to force jurisdictions to recognize geographic indicators without the assistance of a broader regulatory framework. Still, local attempts to create appellations can generate momentum and set precedent for other jurisdictions to replicate the model. It is not a given that the TTB will establish marijuana appellation regulations upon legalization, but state and local governments can make that more likely by creating the foundations for regulation.

Indeed, if states and the marijuana industry succeed in establishing marijuana appellations, it seems likely that the TTB (or another appropriately designated federal agency) will be forced to at least consider whether federal regulation of marijuana appellations is justified. As federal regulation of the wine industry led to the creation of American Viticultural Areas, so federal regulation of the marijuana industry may lead to the development of American Cannabicultural Areas. In fact, prior to the establishment of federally regulated AVAs in 1978, state and county appellation designations were the norm for the wine industry.[81] AVAs can now be used to recognize wine-growing regions defined by their geographic or environmental characteristics, instead of their political boundaries, but the state and county appellations still function as legal designations of origin.[82] States and counties need not hesitate to move forward with their own marijuana appellation designations despite the lack of federal involvement. Until the federal government regulates marijuana agriculture, the wine industry's transition from politically driven appellations to environmentally driven appellations provides a model for the marijuana industry to follow in advancing marijuana appellations.

A more substantive question facing a potential state or federal ACA framework is this: does the marijuana industry want to follow the French or American approach to appellation regulations? The American wine appellation model requires only that wines using an appellation designation actually

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[79] *See* Laura Zanzig, *The Perfect Pairing: Protecting U.S. Geographical Indicators with a Sino-American Wine Registry*, 88 WASH. L. REV. 723, 724 (2013).

[80] For example, California Cannabis Voice Humboldt and Emerald Growers Association represent marijuana farmers in northern California. *See Who is California Cannabis Voice Humboldt (CCVH)?*, CAL. CANNABIS VOICE HUMBOLDT, http://ccvhumboldt.org/about [https://perma.cc/PX26-3U7J]; *Emerald Growers Association*, MEDICALJANE, https://www.medicaljane.com/directory/company/emerald-growers-association/ [https://perma.cc/FV8W-2XFK].

[81] *See* 27 C.F.R. § 4.25(e)(1) (2012); Sara Schorske & Alex Heckathorn, *The Stakes in the Name Game Just Got Higher*, CSA (Mar. 2002), http://www.csa-compliance.com/html/CSA-Articles/stakes-in-the-name-game.html [https://perma.cc/QR28-324M].

[82] *See* 27 C.F.R. §§ 9.21–218 (2012).

come from that appellation region.[83] American appellation designations do not speak to the quality of the wine. This is in contrast to the French appellation model, among others, in which the appellation designation is only allowed if stringent cultivation rules and regulations are followed, ensuring that wines carrying appellation designations meet high quality standards.[84] There are trade-offs characteristic to both systems. The French model provides quality assurances at the cost of agricultural freedom. The U.S. model, by contrast, fosters innovation but fails to convey any non-geographic information.

When deciding which system is best for the marijuana industry, it may be useful to keep in mind that the French appellation model—with its stringent rules and standards—was developed over thousands of years of experimentation and refinement.[85] More than likely, it would be premature to apply similar rules to the cultivation of marijuana in its nascent state. Simply recognizing that appellations are a fruitful model for marijuana agriculture, and establishing those appellations, will be a challenging regulatory objective.

Nonetheless, individual appellations may benefit from establishing a limited set of cultivation requirements. One category of characteristics is proving to be especially important to marijuana consumers: indicators of sustainability. Generally speaking, many marijuana consumers are demanding products that are grown organically, or with minimal environmental impact.[86] At present, however, the marijuana industry lacks a mechanism (government-sponsored or otherwise) to certify crops that meet environmental or sustainability standards.[87]

Appellations can provide certifications to farmers that meet these standards, or they can make them requirements of the appellation designation. For example, the marijuana industry has come under intense scrutiny on account of the energy demands of indoor agriculture, and appellations could require indoor operations to meet clean energy standards. One county has already required indoor farms to use exclusively renewable energy sources.[88] In other regions—such as northern California—water use is more problematic.[89] Appellations in those regions can tailor their standards and requirements to the uniquely local environmental impacts that farming creates,

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[83] For example, for states and counties, not less than seventy-five percent of the volume of the wine is derived from grapes grown in the labeled appellation, and in AVAs, not less than eighty-five percent. *See Wine Appellations of Origin*, *supra* note 31.

[84] *See id.*

[85] *See id.*

[86] *See* Erica Freeman, *Demand for Organic Cannabis Growing, Too*, COLORADOAN (May 5, 2016), http://www.coloradoan.com/story/opinion/2016/05/05/freeman-demand-organic-cannabis-growing/83897236/ [http://perma.cc/U9GM-P2UC].

[87] *See* Donna Jones, *Organic Marijuana Can't Exist, Which Troubles Growers*, L.A. TIMES (Aug. 20, 2011), http://articles.latimes.com/2011/aug/20/business/la-fi-organic-pot-20110811 [http://perma.cc/2VJX-ZS2F].

[88] *See* Humboldt Cnty., Cal., Ordinance No. 2544 (Jan. 16, 2016).

[89] *See* Bauer et al., *supra* note 67.

making the regulation of marijuana agriculture more locally driven and ecologically responsive.

The role appellations can play in certifying agricultural practices is particularly attractive in the absence of mechanisms available to certify organic marijuana products. The federal government substantially occupies the field of organic agriculture, such that the term "organic" has been effectively federalized. In other words, agricultural products can only be labeled organic if they were grown in accordance with federal standards.[90] In addition, the federal government occupies the certification process, as the need for uniform federal certification standards and processes was a primary justification for federal organic legislation in the first place.[91]

Because marijuana remains a controlled substance prohibited under federal law, and organic certification remains a federal field of regulation,[92] marijuana products cannot be labeled organic regardless of the method of cultivation.[93] As a consequence, the marijuana industry has established third-party certification programs that attempt to recognize organic marijuana agriculture in indirect ways. Certification programs mirror the USDA's organic agriculture requirements, but instead of using the "organic" label, programs use terms such as "naturally grown," "Clean Green Certified," or "Certified Kind."[94]

These marijuana certification programs compete with each other to represent the gold standard for organic agriculture, but as third-party certifiers

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[90] *See* Compliance Requirements, 7 U.S.C. § 6505(a)(1) (2012); Quesada v. Herb Thymes Farm Inc., 361 P.3d 868 (Cal. 2015).

[91] *See* National Organic Production Program, 7 U.S.C. § 6503(a) (2012).

[92] In practice, enforcement of federal organic legislation often takes place at the state level by state officials promulgating organic certification programs, but these programs must be approved by the USDA and in accordance with federal standards. *See* State Organic Certification Program, 7 U.S.C. § 6507 (2012). Thus, there is room for state involvement in the form of cooperative federalism, but organic agriculture remains a federal field of regulation. *But see generally* Laura Fisher, *Administrative Law—All (Food) Politics is Local: Cooperative Federalism, New England Small Farms, and the Food Safety Modernization Act*, 37 W. NEW ENG. L. REV. 337 (2015) (calling for more state and local involvement in agricultural policy).

[93] *See* David Migoya & Ricardo Baca, *Colorado AG's Office Investigates Marijuana Companies Using the Word "Organic,"* DENVER POST (Sept. 16, 2015), http://www.denverpost.com/2015/09/16/colorado-ags-office-investigates-marijuana-companies-using-word-organic/ [http://perma.cc/FEF7-UZGD] ("'Marijuana may not be certified organic under the USDA organic regulations,' said a USDA spokesman who could not be named because it's the agency's policy when discussing marijuana. 'Marijuana is considered a controlled substance at the federal level, and organic certification is reserved for agricultural products.'").

[94] *See, e.g.*, CLEAN GREEN, http://www.cleangreencert.org/ [http://perma.cc/RK3E-KTK7] ("Clean Green Certified was created in 2004 as a way to regulate legal cannabis-products that called themselves 'organic.' Consumers can rest assured when they buy a Clean Green cannabis product that it has met all of the requirements of the rigorous testing program."); *Certified Kind: Certification for Responsibly Grown Cannabis*, CERTIFIED KIND LLC, http://certified-kind.com/ [http://perma.cc/U8G3-HWUG] ("Since USDA Organic certification is not yet allowed for Cannabis, Certified Kind exists to offer certification for the organic cannabis farmer and processor. Certified Kind growers are able to use the Certified Kind name and logo to differentiate their crop and support earth-friendly cannabis production.").

their impact on the industry remains limited without a broader regulatory framework to evenly apply and enforce labeling standards. There is evidence that marijuana being labeled and sold as "naturally grown" has not undergone certification of any kind.[95] Marijuana appellations may provide a more credible, and collectively agreed upon, mechanism to provide the equivalent of organic certifications. There is some risk that, by allowing each appellation to create its own standards for what is considered organic, sustainable, or environmentally friendly, the marijuana industry as a whole would lack consensus on these important terms. On the other hand, the novelty of regulating marijuana agriculture, for both regulators and the regulated, calls for tolerance of innovative and diverse approaches. The effectiveness of an enterprising appellation's certification program may lead to widespread adoption, or enhance the appellation's brand to consumers.

There is reason to doubt that the marijuana industry can or should adopt appellations, however. Perhaps the most significant obstacle is the fact that a significant percentage of marijuana is grown indoors. Since outdoor cultivation was risky during prohibition, the marijuana industry has a long track record of, and experience with, indoor cultivation. Growing indoors now offers advantages beyond privacy, allowing farmers to manipulate growing conditions such as soil content, air temperature, and light energy to maximize yields.[96] As one might expect, however, growing indoors arguably makes the "terroir," or geographic elements, irrelevant.[97]

However, appellations can still be useful in creating unique localized markets if regions adopt certain growing standards. Appellations could also provide incentives for the industry to transition to, and embrace, outdoor cultivation by providing the geographic indicator protection (and its economic benefits) solely to outdoor marijuana farms. Whether or not appellations make sense for indoor farming is an unresolved debate in the marijuana farming community.[98] It may be that appellations allow each farming region to settle the debate locally, instead of pushing for statewide or national policies.

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[95] *See* Alice Truong, *The Bay Area's Latest Movement: Organic Marijuana*, QUARTZ (Jan. 29, 2015), https://qz.com/334826/the-bay-areas-latest-movement-organic-marijuana/ [https://perma.cc/8UXY-FYNJ]. In Colorado, for example, the Colorado Department of Agriculture provides organic certification and enforcement on behalf of the USDA, but the term "organic" has been used by many marijuana businesses in their advertising, product labeling, and branding, with little to no state enforcement. *See Organic*, COLO. DEP'T OF AGRIC. (2017), https://www.colorado.gov/pacific/agplants/organic [https://perma.cc/D7HS-Q7X7]; Migoya & Baca, *supra* note 93 (discussing USDA certifications for marijuana).

[96] *See generally* ROBERT BERGMAN, MARIJUANA GROW BIBLE (2014) (suggesting optimum growing conditions for indoor cultivation).

[97] This is a matter of some debate within the marijuana agriculture community. *Compare* Mansur, *supra* note 8 (arguing that "sungrown" marijuana has terroir characteristics that an appellation designation is equipped to promote), *with* Sweeney, *supra* note 8 (citing a farmer who insists the region's terroir can be introduced to indoor environments).

[98] *See id.*

In addition, while appellations would frustrate efforts to commoditize marijuana, an appellation system would not preclude consolidation. The U.S. wine industry has been experiencing rapid consolidation despite a robust, origin-focused appellation system.[99] Nonetheless, the number of small-scale vineyards has remained stable, indicating a strong market for unique wines.[100] And it may be that consolidation is facilitated by the fact that U.S. appellation designations are only concerned with geographic origin, and do not impose quality or cultivation standards on producers.

In any case, the benefits of a marijuana appellation system are numerous and merit consideration by policymakers. Especially in regions concerned that mass-produced generic marijuana will have devastating economic consequences for small-scale farmers, finding ways to differentiate products and generate market value will be an important policymaking objective. A marijuana appellation system may provide the regulatory framework needed to achieve it.

And for an industry that is new to farmers, regulators, and consumers alike, there is value in adopting a regulatory system that readily conveys information about a product's origin, among other characteristics. Cannabicultural designations of origin need not dominate or overwhelm the marijuana industry, as the next part demonstrates, but they do represent a promising regulatory model for marijuana agriculture.

IV. Industrial Hemp and the Promotion of Parallel Cannabis Markets

The plant species *cannabis sativa*, as explained in Part II, can be bred to produce hundreds of different strains, each with unique characteristics. Many of these strains are relatively new to the market, but one strain of the species—industrial hemp—has been cultivated for thousands of years.[101] While marijuana strains are primarily grown and used for their medicinal or recreational psychoactive properties, hemp strains are grown to produce foods and beverages, textiles, paper, cosmetic products, insulation materials, and even energy.[102] They have few if any psychoactive properties, unlike their marijuana relatives.

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[99] *See* Rachael E. Goodhue et al., *California Wine Industry Evolving to Compete in 21st Century*, 62 Cal. Agric. 12, 16–17 (2008).

[100] *See id.* at 17.

[101] For reviews of the taxonomy of marijuana and hemp, see generally Ernest Small & Arthur Cronquist, *A Practical and Natural Taxonomy for Cannabis*, 25 Taxon 405 (1976), and Shannon L. Datwyler & George D. Weiblen, *Genetic Variation in Hemp and Marijuana (*Cannabis sativa L.*) According to Amplified Fragment Length Polymorphisms*, 51 J. Forensic Sci. 371 (2006).

[102] *See generally* Rowan Robinson, The Great Book of Hemp: The Complete Guide to the Environmental, Commercial, and Medicinal Uses of the World's Most Extraordinary Plant (Park Street Press 1996) (describing the variety of products derived from hemp).

For much of early U.S. history, hemp was the predominant cannabis crop. Queen Elizabeth required large landowners throughout the British Empire to grow hemp to counter Britain's reliance on Russian hemp imports;[103] later the Jamestown colonists would be required to do the same.[104] Both George Washington and Thomas Jefferson were hemp growers, and the Declaration of Independence was written on hemp.[105] John Adams was a prominent supporter of hemp cultivation, writing frequently about its benefits.[106] "Seems to me if grate Men don't leeve off writing Pollyticks, breaking Heads, boxing Ears, ringing Noses and kicking Breeches, we shall by and by want a world of Hemp more for our own consumshon," Adams wrote.[107]

Hemp would continue to be grown throughout the nineteenth and early-twentieth centuries.[108] When Congress sought to discourage marijuana consumption by passing the Marihuana Tax Act in 1937,[109] farmers were encouraged to continue cultivating hemp in order to sustain fiber and oil supplies during World War II.[110] After the war, however, anti-drug campaigns portrayed cannabis as a dangerous and destabilizing plant, and cotton and other textile producers lobbied to prohibit the cultivation of both hemp and marijuana. The Controlled Substances Act of 1970 (CSA) effectively banned cannabis cultivation of any kind, including industrial hemp.[111]

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[103] *See* Barney Warf, *High Points: An Historical Geography of Cannabis*, 104 GEOGRAPHICAL REV. 414, 426 (2014).

[104] *See* MARTIN A. LEE, SMOKE SIGNALS: A SOCIAL HISTORY OF MARIJUANA—MEDICAL, RECREATIONAL, AND SCIENTIFIC 16 (Scribner, 2012).

[105] *See id*. at 16–18.

[106] *See* Corliss Knapp Engle, *John Adams, Farmer and Gardener*, 61 ARNOLDIA 9, 10 (2002).

[107] John Adams, writing as "Humphrey Ploughjogger," in the Boston Evening Post on June 20, 1763, *Papers of John Adams: Volume 1*, MASS. HISTORICAL SOCIETY (2017), https://www.masshist.org/publications/apde2/view?id=ADMS-06-01-02-0045-0002 [https://perma.cc/E5G9-5G4E].

[108] By some accounts, it became the third largest cash crop in the United States by the mid-nineteenth century. *See* LEE, *supra* note 104, at 17.

[109] Marihuana Tax Act of 1937, Pub. L. No. 75-238, 50 Stat. 551 (1937).

[110] *See* RENÉE JOHNSON, CONG. RESEARCH SERV., RL32725, HEMP AS AN AGRICULTURAL COMMODITY 13 (2015).

[111] Technically, the CSA did not prohibit hemp production, but required a permit from the DEA. No permit was ever issued for industrial hemp cultivation. *See id*. at 14; Steve Raabe, *First Major Hemp Crop in 60 Years Is Planted in Southeast Colorado*, DENVER POST (May 13, 2013), http://www.denverpost.com/2013/05/13/first-major-hemp-crop-in-60-years-is-planted-in-southeast-colorado/ [https://perma.cc/P4ER-4YB4]. The actual definition of "marihuana" in the CSA is somewhat vague, allowing for conflicting interpretations between hemp producers and the DEA:

> The term marihuana means all parts of the plant Cannabis sativa L., whether growing or not; the seeds thereof; the resin extracted from any part of such plant; and every compound, manufacture, salt, derivative, mixture, or preparation of such plant, its seeds or resin. Such term does not include the mature stalks of such plant, fiber produced from such stalks, oil or cake made from the seeds of such plant, any other compound . . . or preparation of such mature stalks (except the resin extracted therefrom), fiber, oil, or cake, or the sterilized seed of such plant which is incapable of germination.

Despite the prohibition, industrial hemp has remained a remarkably versatile and widely grown crop. It is legal to cultivate in at least thirty countries, producing more than twenty-five thousand different products on the global market.[112] Since U.S. farmers have not been able to cultivate hemp themselves, most hemp-derived products sold in the United States are imported, with China, Canada, and European Union countries accounting for a majority of the imports.[113]

As sentiments toward marijuana have softened in recent years, the case against industrial hemp, in particular, has become less convincing. Federal legislation has progressively chipped away at the prohibition,[114] and the Industrial Hemp Farming Act,[115] which would exclude industrial hemp from the CSA's marijuana definition, increasingly enjoys bipartisan support.[116] Twenty-nine states have enacted hemp legislation to encourage cultivation, despite the ongoing federal prohibition.[117] It seems likely that industrial hemp will become a fully legalized agricultural crop in the next several years.[118]

Unlike marijuana, hemp is well-suited for commoditization. As the current global market for industrial hemp suggests, it is in fact already an agricultural commodity. The European Union subsidizes hemp farming to the tune of four hundred dollars per acre in order to encourage production.[119] It does so, in part, because hemp shows promise as a versatile and sustainable commodity. Hemp promotes soil quality and does not require pesticides, herbicides, or fungicides to grow effectively.[120] It can be used to make food, fiber, and energy.[121] But, because hemp is an industrial input, its artisanal

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21 U.S.C. § 802(16) (2016); *see also* Hemp Indus. Ass'n v. Drug Enforcement Admin., 333 F.3d 1082 (9th Cir. 2003); Interpretation of Listing of "Tetrahydrocannabinols" in Schedule I, 66 Fed. Reg. 51530 (Oct. 9, 2001) (to be codified at 21 C.F.R pt. 1308).

[112] *See* JOHNSON, s*upra* note 110, at 5, 9.

[113] *See id.* at 7.

[114] The Agricultural Adjustment Act of 2014 relaxed restrictions on hemp research (Section 7606), while appropriations bills in recent years have included amendments that prohibit the Department of Justice from using federal funds to interfere with state-legal hemp activities. *See, e.g.*, Commerce and Justice, Science, and Related Agencies Appropriations Act of 2016, H.R. 2578, 114th Cong. (2016); Commerce and Justice, Science, and Related Agencies Appropriations Act of 2015, H.R. 4660, 113th Cong. (2015).

[115] Industrial Hemp Farming Act of 2015, S. 134, 114th Cong. (2015).

[116] *See* VOTE HEMP, CONGRESSIONAL UPDATE (2016), http://www.votehemp.com/PDF/2016-CONGRESS-Hemp-Update-web.pdf [https://perma.cc/CUK2-VLEC].

[117] A variety of bipartisan states are represented such as Florida, California, Arizona, Kansas, New York, and Pennsylvania. *See id.*

[118] The 2016 U.S. presidential election marked a transition between political parties occupying the federal executive. It is unclear what direction federal policy will take with respect to hemp cultivation and regulation, though the growing number of state-level initiatives suggests a robust base of support.

[119] *See* DOUG FINE, HEMP BOUND: DISPATCHES FROM THE FRONT LINES OF THE NEXT AGRICULTURAL REVOLUTION 67 (Chelsea Green Publishing, 2014).

[120] *See id.*

[121] *See id.* at XXII, 47.

potential is limited.[122] The cultivation of hemp does not require meticulous care, either, and as a result, hemp will likely remain an agricultural commodity for the foreseeable future.

It is tempting to assume that, since hemp is an agricultural commodity, marijuana should be too. And in that case, appellations for marijuana would become obsolete. On the contrary, however, marijuana's unique botanical characteristics, and the likely spread of domestic hemp cultivation, make it more urgent to adopt marijuana appellations. Unlike most plants, cannabis is a dioecious species, meaning the individual plants can be male or female.[123] Marijuana crops are grown using exclusively female cannabis plants. This limits the presence of unwanted seeds, while simultaneously increasing yields of THC-producing buds.[124] Unfortunately, cannabis plants can be pollinated across large distances,[125] reducing the quality and yield of marijuana crops.

Strains of industrial hemp are not exclusively female, but cross-pollination is equally undesirable. Across the United States, where states have permitted the cultivation of industrial hemp, its classification as such is at least partly determined by THC content.[126] If marijuana strains pollinate a hemp crop, the THC content of the plants is likely to increase above legal limits.[127] It is therefore desirable to maintain a healthy distance between regions cultivating marijuana and those cultivating hemp.

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[122] Even when grown on a large scale, the profitability of hemp cultivation is not assured. *See id.* at 66; JOHNSON *supra* note 110, at 7–9.

[123] *See* Koichi Sakamoto et al., *Characterization: Genome Sizes and Morphology of Sex Chromosomes in Hemp (*Cannabis sativa L.*)*, 63 CYTOLOGIA 459, 459 (1998).

[124] *See Identifying Cannabis Plant Gender*, CANNABIS CURE (July 23, 2016), http://www.cannabiscure.info/cannabis-plant-gender/ [https://perma.cc/GMM6-UV26].

[125] In some cases, pollination has been observed across a thirty-mile distance. *See* KNUT FAEGRI & JOHS IVERSEN, TEXTBOOK OF POLLEN ANALYSIS (6th ed. 2000); Baltasar Cabezudo et al., *Atmospheric Transportation of Marihuana Pollen from North Africa to the Southwest of Europe*, 31 ATMOSPHERIC ENV'T 3323, 3325 (1997); Sofia Kutuzova et al., *Maintenance of* Cannabis *Germplasm in the Vavilov Research Institute Gene Bank*, 4 J. INT'L HEMP ASS'N 17, 18 (1996); Ernest Small & Tanya Antle, *A Preliminary Study of Pollen Dispersal in* Cannabis sativa *in Relation to Wind Direction*, 8 J. INDUS. HEMP 37, 44–45 (2003); Joy Beckerman, *Myths of Cannabis & Hemp Cross-Pollination*, SEATTLE PI (Apr. 8, 2015), http://blog.seattlepi.com/vivianmcpeak/2015/04/08/myths-of-cannabis-hemp-cross-pollination/ [https://perma.cc/2DRZ-VEA7].

[126] Many states, including Connecticut, Minnesota, Montana, and New Hampshire, mirror the 0.3% THC content requirement found in the Industrial Hemp Farming Act of 2015. *See* Act of July 2, 2015, ch. 29, 2015 Conn. Pub. Acts 15-202; MINN. STAT. §§ 18k.01–18k.04 (West, Westlaw through chapter 5 of the 2017 Reg. Sess. The statutes are subject to change as determined by the Minnesota Revisor of Statutes (these changes will be incorporated later this year)); MONT. CODE ANN. § 80-18-101 (West, Westlaw through chapters effective Feb. 20, 2017, 2017 session. Statutory changes are subject to classification and revision by the Code Commissioner. Court Rules in the Code are current with amendments received through Sept. 1, 2016.); N.H. REV. STAT. ANN. § 433-C:1 (West, Westlaw through Chapter 1 of the 2017 Reg. Sess., not including changes and corrections made by the State of New Hampshire, Office of Legislative Services. (2015)).

[127] *See* Mansur, *supra* note 8.

Logically, navigating this botanical idiosyncrasy will require cooperation within the cannabis agriculture community. A laissez-faire approach that does not address the potential for cross-pollination will likely disrupt crop production. The threat of cross-pollination is not unique to cannabis. Corn and beet farmers must also cooperate to avoid cross-pollination from wild or genetically variable crops.[128] The question facing hemp and marijuana farmers is: what cooperation mechanism can ensure that cross-pollination is prevented or minimized?

There are several well-known agricultural techniques farmers and agricultural regulators use to minimize cross-pollination or cross-fertilization, many of which require crops to be isolated in one fashion or another.[129] Spatial isolation can be established by creating isolation distance requirements that place crops a minimum distance from one another.[130] This approach would require intense monitoring, and given the distances cannabis pollen can travel, may be ineffectual or impracticable. Alternatively, planting dates for hemp and marijuana crops could be staggered such that plants flower or mature at different intervals, thus achieving temporal isolation.[131] Staggering flowering times is challenging, however, when strains are diversified and weather conditions disrupt expectations. This approach also requires intense coordination between neighboring farmers, a potentially unrealistic expectation. A third strategy would physically isolate crops by requiring them to be bagged or covered when mature. This would effectively mandate indoor agriculture for marijuana and hemp cultivation, an energy-intensive and heavy-handed approach.[132]

Farmers could also agree to cultivate only one crop type (marijuana or hemp) in a given agricultural region. The climatic preferences of hemp and marijuana suggest this approach is preferable from an agricultural point of view anyway. Marijuana has a smaller footprint and thrives in mountainous Mediterranean zones (with wet winters and hot, dry summers), whereas in-

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[128] *See* Detlef Bartsch et al., *Environmental Implications of Gene Flow from Sugar Beet to Wild Beet—Current Status and Future Research Needs*, 2 ENVTL. BIOSAFETY RES. 2, 2 (2003); Kent Brittan, *Methods to Enable Coexistence of Diverse Corn Production Systems*, AGRIC. BIOTECH. IN CAL. no. 8192, 2006, at 1.

[129] For a discussion of the European Union's extensive crop coexistence regulations, see Koreen Ramessar et al., *Going to Ridiculous Lengths—European Coexistence Regulations for GM Crops*, 28 NATURE BIOTECH. 133 (2010).

[130] This is common in corn cultivation. *See id.*; Brittan, *supra* note 128, at 3.

[131] Again, this is a commonly proposed corn cultivation technique. *See* Brittan, *supra* note 128, at 4.

[132] Covering plants to prevent cross-fertilization is more popular for small-scale gardening. Indoor agriculture's energy footprint is extensive, particularly with respect to indoor marijuana. *See* Evan Mills, *The Carbon Footprint of Indoor* Cannabis *Production*, 46 ENERGY POL'Y 58 (2012); Jennifer Oldham, *As Pot-Growing Expands, Electricity Demands Tax U.S. Grids*, BLOOMBERG BUS. (Dec. 21, 2015), https://www.bloomberg.com/news/articles/2015-12-21/as-pot-growing-expands-power-demands-tax-u-s-electricity-grids [https://perma.cc/2LVH-6TBA].

dustrial hemp can be grown in wetter, colder climates,[133] and in vast, dense fields.[134]

Appellations represent a natural mechanism to facilitate cooperation between hemp and marijuana farmers. By establishing cultivation rules and standards for each region, appellations cater to the region's topographical and agricultural strengths. Appellations can be designated as marijuana-producing or hemp-producing, or, alternatively, they can facilitate the more involved cooperation required if crops are grown in close proximity to each other. The former may be more pragmatic, and in Oregon, appellations are already being promoted for exactly this purpose.[135]

Regardless of approach, the cultivation of industrial hemp and marijuana is likely to increase dramatically in the coming months and years as legal restrictions on farmers are relaxed. For many reasons—including the need to minimize cross-pollination between hemp and marijuana crops—it is essential that farmers and regulators coordinate this growth in agricultural development. Appellations are a promising mechanism to minimize disruption between farmers and ensure that cannabis agriculture grows smoothly and strategically.

Conclusion

In mid-June 2016, the Mendocino Appellations Project released a map showing Mendocino County, California, divided into eleven marijuana appellations.[136] Mendocino County is one of the country's largest producers of marijuana,[137] and the appellations are based on each micro-region's ecological characteristics, much as the region's wine appellations are.[138] The effort has received support from marijuana farmers and appellations experts,[139] and may soon provide a model for other counties and states to replicate. And if the California Bureau of Medical Marijuana Regulation chooses to establish appellations of origin for marijuana agriculture in the future,[140] the Mendocino Appellations Project is likely to play a key role in shaping the development of state-sanctioned appellations in the region.

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[133] *See* Mansur, *supra* note 8, at 5–6.

[134] *See* Fine, *supra* note 119, at XXIV.

[135] *See* Mansur, *supra* note 8, at 7 ("Oregon should adopt a cannabis appellation system to help prevent problems likely to arise from cultivation of differing industrial hemp varieties low in THC and the high THC varieties of marijuana needed for the medical and adult use markets.").

[136] *See* Sweeney, *supra* note 8.

[137] *See id.*

[138] *See id.*

[139] One wine appellation expert, remarking on the map's creator, noted, "I like the way he's gone about it, because he's factored in not just the natural elements, he's gone out and spoken to growers, asking the old-timers what they think, and is making revisions. He's being true to the history. This is a template for the future, creating a dossier of physical and human, historical factors—I applaud him for that." Sweeney, *supra* note 8.

[140] The agency has the authority to create marijuana appellations pursuant to Act of Oct. 09, 2015, ch. 719, 2015 Cal. Stat. 19332.5(b).

A similar proposal was put forward in Oregon following passage of the state's hemp and marijuana cultivation statutes in 2014.[141] Other states have not seriously considered the appellation model for their marijuana agriculture regulations. However, it is time for stakeholders in the industry, including farmers, regulators, and consumers, to consider cannabicultural designations of origin as a regulatory model for marijuana agriculture. Marijuana appellations need not preclude the large-scale cultivation of cannabis, and if well-conceived, can provide an array of benefits without imposing undue regulation on farmers and marijuana businesses.

As this new industry matures, some mechanism will be needed to help guide the development of marijuana agriculture. There are a number of questions facing the marijuana industry, many of which marijuana appellations cannot answer. Political uncertainty regarding marijuana legalization and regulation on the federal level remains an outstanding concern. But appellations can provide some measure of economic and environmental security while conveying important information to consumers. Attempts to commoditize and consolidate the cultivation of marijuana are likely to emerge, but the drawbacks for farmers, regulators, and consumers are significant. Appellations provide a more promising alternative future for marijuana agriculture.

[141] *See* Mansur, *supra* note 8.