
WEEDING THE GARDEN OF PESTICIDE REGULATION: WHEN THE MARIJUANA INDUSTRY GOES UNCHECKED

ABSTRACT

Legalized marijuana is spreading across the United States like, well, a weed. Recreational marijuana has been legalized in states such as Colorado and Washington since 2012. In 2015, the lack of government oversight and regulation of the pesticides being used by commercial marijuana growers drew media attention and public outrage. Like any crop consumed by humans, there are health risks associated with unrestricted use of pesticides on marijuana. Yet, because the federal government continues to classify marijuana as a Schedule I substance under the Controlled Substances Act, the Environmental Protection Agency has not filled its usual role of approving pesticides as safe for use on crops with regard to marijuana. Instead, any regulation of pesticides being used on marijuana plants has been left to those states that have legalized marijuana sales without the benefit of scientific research to guide the development of these regulations.

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I. INTRODUCTION

Marijuana is ubiquitous throughout the United States, regardless of state boundaries dictating where marijuana possession and consumption are or are not legal. According to the Substance Abuse and Mental Health Services Administration, marijuana is the most commonly used illicit drug in the United States, with an estimated 22.2 million residents having used marijuana in 2014.¹ However, legal use of marijuana—at least legal under state law—is also common, with marijuana legalized for use in some form in 45 states.² Seventeen of those states have legalized marijuana for medical use in only one form: cannabidiol (CBD) products, which are usually oils.³ CBD

1. SUBSTANCE ABUSE & MENTAL HEALTH SERVS. ADMIN., U.S. DEP’T OF HEALTH & HUMAN SERVS., DHHS PUB. NO. SMA 15-4927, BEHAVIORAL HEALTH TRENDS IN THE UNITED STATES: RESULTS FROM THE 2014 NATIONAL SURVEY ON DRUG USE AND HEALTH 1 (2015), <http://www.samhsa.gov/data/sites/default/files/NSDUH-FRR1-2014/NSDUH-FRR1-2014.pdf> (basing estimates on responses from individuals surveyed for the annual National Survey on Drug Use and Health).

2. *State Medical Marijuana Laws*, NAT’L CONF. ST. LEGISLATURES (Nov. 9, 2016), <http://www.ncsl.org/research/health/state-medical-marijuana-laws.aspx> (showing approval for full medical use in 28 states and approval for medical use of CBD products in 17 states); *see also State Marijuana Laws in 2016 Map*, GOVERNING, <http://www.governing.com/gov-data/state-marijuana-laws-map-medical-recreational.html> (last visited Nov. 1, 2016) (displaying by map the states that have legalized marijuana in some form).

3. *See State Medical Marijuana Laws*, *supra* note 2, tbl. 2 (showing that approved CBD products are defined differently by each state law but generally must be low in tetrahydrocannabinol (THC) and high in CBD).

is a chemical compound found in cannabis—distinct from the chemical compound tetrahydrocannabinol (THC) that causes users to get “high”—that is non-psychoactive and is gaining significant recognition for having medicinal benefits.⁴ Twenty-eight additional states, the District of Columbia, Guam, and Puerto Rico have legalized marijuana for medical use in any form.⁵ Of those states that have fully legalized medical marijuana, Alaska, California, Colorado, Maine, Massachusetts, Nevada, North Dakota, Oregon, Washington, and the District of Columbia have also recently legalized marijuana for recreational use.⁶

Despite the popularity of legalized marijuana, in the summer of 2015, citizens began protesting the use of pesticides on commercially sold marijuana plants in some of these states, notably Colorado.⁷ After Coloradans amended their state constitution to legalize medical marijuana in 2000 and to legalize recreational marijuana in 2012, Colorado state agencies were required to create a regulatory framework for monitoring a previously illegal industry.⁸ Much of Colorado’s initial implementation of marijuana legalization addressed the licensing and taxing of the marijuana industry.⁹ Additionally, part of this regulatory framework addressed the

4. *5 Must-Know Facts About Cannabidiol (CBD)*, LEAF SCI. (Feb. 23, 2014), <http://www.leafscience.com/2014/02/23/5-must-know-facts-cannabidiol-cbd/>.

5. See *State Medical Marijuana Laws*, *supra* note 2.

6. See COLO. CONST. art. XVIII, § 16 (added to the Colorado Constitution by ballot measure in 2012); ALASKA STAT. ANN. §§ 17.38.010, 17.38.020, 17.38.060 (West 2016) (passed by Alaska Ballot Initiative 2 in 2014); D.C. CODE ANN. § 48-904.01 (West 2016) (passed by Ballot Measure in 2014); N.D. CENT. CODE ANN. §§ 19-24-01 to 19-24-13 (West 2016); OR. REV. STAT. ANN. § 475.864 (West 2016) (passed by Oregon Ballot Measure 91 in 2014); WASH. REV. CODE ANN. § 69.50.4013(3) (West 2016) (passed by Washington Initiative 502 in 2012); Ben Gilbert, *4 States Just Voted to Make Marijuana Completely Legal—Here’s What We Know*, BUS. INSIDER (Nov. 9, 2016), <http://www.businessinsider.com/marijuana-states-legalized-weed-2016-11>; see also *State Medical Marijuana Laws*, *supra* note 2.

7. See Joel Warner, *Marijuana Legalization 2015: EPA Issues Guidance on Marijuana Pesticides Amid Industry Uncertainty*, INT’L BUS. TIMES (June 9, 2015), <http://www.ibtimes.com/marijuana-legalization-2015-epa-issues-guidance-marijuana-pesticides-amid-industry-1959030>.

8. David Blake & Jack Finlaw, *Marijuana Legalization in Colorado: Learned Lessons*, 8 HARV. L. & POL’Y REV. 359, 359, 363, 364–65 (2014). Medical marijuana was legalized under Amendment 20, and recreational marijuana was legalized under Amendment 64. See *id.* at 359, 363.

9. See H.B. 13-1317, 69th Gen. Assemb., 1st Reg. Sess., 2013 Colo. Sess. Laws 329 *passim*. For a discussion of the implementation of Amendment 64 in Colorado, see generally Blake & Finlaw, *supra* note 8.

growing conditions of marijuana plants, including the application of pesticides.¹⁰

Like most crops grown in the United States, marijuana is vulnerable to pests.¹¹ However, unlike for most crops, the Environmental Protection Agency (EPA)¹² has not approved any pesticides for use on marijuana plants, and 28 U.S.C. § 136j(a)(2)(G) dictates that a pesticide may not be used inconsistently with its labeling.¹³ Therefore, application of any pesticide not approved for general use on marijuana plants violates federal law.¹⁴ This leaves marijuana growers with the options of either: (1) using no pesticides, (2) using pesticides that do not require EPA approval for use on crops, or (3) illegally using pesticides approved for other crops.¹⁵ Test samples of marijuana overwhelmingly reveal that growers are choosing to use unapproved and unregulated pesticides, creating a serious public health risk for consumers.¹⁶

This Note explains the public health risks currently being created by the lack of government oversight of pesticide usage in the marijuana industry and examines potential means of reducing those risks, using the state of Colorado as a case study. Part II outlines the current statutory and regulatory framework of federal and state laws governing pesticides and marijuana. Part III assesses the current situation of the retail marijuana

10. See 1 COLO. CODE REGS. § 212-2.504 (LexisNexis 2016) (“A Retail Marijuana Cultivation Facility may only use Pesticide in accordance with the ‘Pesticide Act’, section 35-9-101 et seq., C.R.S., ‘Pesticides Applicators’ Act,’ section 35-10-101 et seq., C.R.S., and all other applicable federal, state, and local laws, statutes, rules and regulations.”); Blake & Finlaw, *supra* note 8, at 366–67.

11. RODGER VOELKER & MOWGLI HOLMES, CANNABIS SAFETY INST., PESTICIDE USE ON CANNABIS 3 (2015), <http://cannabissafetyinstitute.org/wp-content/uploads/2015/06/CSI-Pesticides-White-Paper.pdf> (“Cannabis . . . is frequently damaged by molds and insects . . .” (citations omitted)).

12. The EPA is the agency primarily responsible for regulating pesticides under federal law in the United States. See, e.g., *Federal Pesticide Regulation*, NAT’L PESTICIDE INFO. CTR., <http://npic.orst.edu/reg/regfed.html> (last updated Feb. 22, 2016).

13. See Warner, *supra* note 7.

14. VOELKER & HOLMES, *supra* note 11, at 13; see *infra* notes 23–26 and accompanying text.

15. See Warner, *supra* note 7.

16. See VOELKER & HOLMES, *supra* note 11 (reporting pesticides on nearly half of the marijuana sold in Oregon and potential resulting public health and environmental consequences); Nicholas Sullivan et al., *Determination of Pesticide Residues in Cannabis Smoke*, J. TOXICOLOGY, no. 2013, at 1, 2 (reporting “exceedingly high levels” of residual pesticides in California marijuana samples).

industry in Colorado and describes the problem created by the lack of regulation of pesticides used on marijuana. Part IV illustrates the three challenges that the marijuana industry faces in overcoming its lack of approved pesticides. Part V suggests solutions to address the public health risk being created by the gap in pesticide regulations and evaluates the current solutions being pursued by Colorado. The aim of this Note is not to advocate for broad legalization of marijuana but to advocate for reevaluation of marijuana's current classification under federal law because of the risks being created—rather than prevented—by that classification.

II. WEEDING THROUGH THE CURRENT LAWS ON PESTICIDES AND MARIJUANA

A. *Current Pesticide Laws*

Federal laws, state laws, and local ordinances all currently regulate pesticides in the United States.¹⁷ There are two primary federal statutes governing pesticide usage: the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and the Federal Food, Drug, and Cosmetic Act (FFDCA).¹⁸ In Colorado, there are two primary state statutes regulating pesticides: the Colorado Pesticide Act and Colorado Pesticide Applicators' Act.¹⁹ Counties and municipalities are permitted to further regulate pesticides under the FIFRA, so long as those requirements are not inconsistent with the FIFRA.²⁰

1. *Federal Regulation of Pesticides*

a. *Pesticide classification under the FIFRA.* As the primary source of pesticide regulation since its adoption in 1947, the FIFRA regulates the registration, licensing, and labeling of pesticides being manufactured and

17. See *Bates v. Dow Agrosciences LLC*, 544 U.S. 431, 441, 452 (2005) (holding that because local ordinances regulating pesticides were not preempted by the FIFRA, neither were additional state law requirements).

18. Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), 7 U.S.C. §§ 136–136y (2012 & Supp. III 2016); Federal Food, Drug, and Cosmetic Act (FFDCA), 21 U.S.C. § 346a (2012).

19. Colorado Pesticide Act, COLO. REV. STAT. ANN. §§ 35-9-101 to 35-9-128 (West 2016); Colorado Pesticide Applicators' Act, COLO. REV. STAT. ANN. §§ 35-10-101 to 35-10-128 (West 2016).

20. See *Wis. Pub. Intervenor v. Mortier*, 501 U.S. 597, 616 (1991) (holding that the FIFRA does not preempt municipal ordinances regulating pesticides).

sold in the United States.²¹ *Pesticide* is broadly defined under the FIFRA and includes those substances that are commonly called herbicides, insecticides, fungicides, and rodenticides.²² The FIFRA prohibits the distribution or sale of any unregistered pesticide and the use of a registered pesticide in a manner inconsistent with its registration.²³ A manufacturer applies to register a pesticide under the FIFRA by providing extensive information about its proposed use, formula, safety, and efficacy to the EPA; this usually occurs after the manufacturer has conducted product testing.²⁴ If the EPA approves the pesticide, it classifies the pesticide for either general or restricted use.²⁵

Once approved by the EPA, a pesticide is labeled for the uses for which it has been specifically approved; thereafter, it is illegal to use a pesticide in any way inconsistent with that labeling—for example, applying it to an unapproved crop such as marijuana.²⁶ A pesticide is classified for general use if it will not cause “unreasonable adverse effects on the environment” and may safely be used by the general public—an example being Roundup®.²⁷ A pesticide is classified for restricted use when, even applied in the approved method for the approved use, it maintains a risk of adverse effects on the environment or poses a hazard to the pesticide applicator or other people, such as consumers.²⁸ A restricted use pesticide may only be applied by a certified pesticide applicator, and the pesticide’s label must state the

21. See 7 U.S.C. § 136a; *Bates*, 544 U.S. at 437–38 (quoting *Ruckelshaus v. Monsanto Co.*, 467 U.S. 986, 991 (1984)) (explaining the adoption and subsequent amendment of federal regulations on pesticides that eventually led to the “comprehensive regulatory statute” of FIFRA).

22. See 7 U.S.C. § 136 (“[P]esticide[s] are] any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest . . . for use as a plant regulator, defoliant, or desiccant . . . [or] any nitrogen stabilize”); RUSTY RUMLEY, THE NAT’L AGRIC. LAW CTR., APPROVAL OF PESTICIDES 1 (2012) (citation omitted), http://nationalaglawcenter.org/wp-content/uploads/assets/articles/rumley_approval.pdf (estimating that there are 18,000 pesticide products in use in the United States).

23. 7 U.S.C. §§ 136a(a), 136j(a)(1); 40 C.F.R. § 152.15 (2016).

24. 7 U.S.C. § 136a(c)(1); see RUMLEY, *supra* note 22, at 3 (listing the “wide variety of information” that pesticide manufacturers must submit during the registration process, including scientific data on toxicity, possible environmental effects, chemical makeup, hazards to humans, and technical information such as manufacturing processes).

25. See 7 U.S.C. § 136a(d)(1)(A).

26. See RUMLEY, *supra* note 22, at 2.

27. See 7 U.S.C. § 136a(d)(1)(B); RUMLEY, *supra* note 22, at 2.

28. 7 U.S.C. § 136a(d)(1)(C).

pesticide's classification and directions for use, including what areas and plants may be treated with the pesticide.²⁹ A person using a pesticide inconsistently with its label may be subject to civil or criminal penalties, and the pesticide being misused may be seized.³⁰

b. *Additional federal protections under the FFDCa.* The FFDCa imposes additional protections from pesticides for plants deemed to be a "food crop."³¹ Food crops include plants that would be commonly or usually recognized as a food, but produce such as fresh fruits and vegetables are not required to be specifically defined.³² The FFDCa requires the EPA to determine maximum human tolerance levels for pesticide residues on food crops to ensure they are safe for consumption.³³ Since most crops that have been treated with pesticides will not be cleansed entirely of those chemicals before use or consumption, before it will approve a pesticide for use on a particular crop, the EPA must certify that the pesticide does not leave a chemical residue exceeding the set tolerance level for that crop.³⁴ Food crops with pesticide residues in excess of the maximum tolerance level are considered "adulterated" and unsafe for consumption and must be recalled.³⁵

2. State Laws Regulating Pesticides

Federal laws predominate in regulating pesticides, but states may impose additional laws regulating pesticide usage.³⁶ In Colorado, the primary source of state pesticide regulation is the Colorado Pesticide Act, which mirrors the registration and labeling requirements of the FIFRA.³⁷

29. *See id.*; 40 C.F.R. § 156.10(a)(1) (2016); RUMLEY, *supra* note 22, at 2.

30. 7 U.S.C. § 136j(a)(2)(G); *see id.* §§ 136k(b), 136l.

31. *See* FFDCa, 21 U.S.C. § 346a (2012).

32. *Id.* § 341 ("[P]romulgate regulations fixing and establishing for any food, under its common or usual name so far as practicable, a reasonable definition and standard of identity No definition and standard of identity and no standard of quality shall be established for fresh or dried fruits, [or] fresh or dried vegetables.").

33. *Id.* § 346a(a)(1)(A).

34. *See id.*

35. *Id.* §§ 342(a)(1), 346a, 350l.

36. *See* *Bates v. Dow Agrosciences LLC*, 544 U.S. 431, 441, 452 (2005) (holding that because local ordinances on pesticides were not preempted by the FIFRA, neither were additional state law requirements).

37. *See* Colorado Pesticide Act, COLO. REV. STAT. ANN. §§ 35-9-101 to 35-9-128 (West 2016).

The Colorado Pesticide Applicators' Act governs the application of pesticides in Colorado and, like the FIFRA, prohibits the use of a pesticide "inconsistent with labeling directions or requirements."³⁸ However, in addition to the mandates of the FIFRA, the Colorado act prohibits use of a pesticide "in an unsafe, negligent, or fraudulent manner."³⁹

B. Current Marijuana Laws

1. Federal Regulation of Marijuana Under the Controlled Substances Act

In addition to this patchwork of regulations over pesticides, marijuana is regulated by the federal Controlled Substances Act (CSA), which classifies marijuana as a "Schedule I" substance.⁴⁰ Schedule I substances are those considered to have "a high potential for abuse," "no currently accepted medical use," and "a lack of accepted safety for use."⁴¹ Under federal law, it is a criminal offense to possess a controlled substance.⁴² However, drugs placed in Schedules II–V, unlike Schedule I drugs, may be prescribed for medical use.⁴³

The CSA provides for the reclassification of controlled substances by the U.S. Attorney General.⁴⁴ This begs the question, What is keeping marijuana from being classified under a different schedule of the CSA? The primary difference between substances in Schedules I, II, and III is whether the substance has a "currently accepted medical use."⁴⁵ Schedule II substances must have a currently accepted medical use unlike those classified as Schedule I, but substances in both schedules are considered to have high potential for abuse.⁴⁶ Schedule III substances have less potential for abuse than Schedule I or II substances and have a currently accepted

38. Compare 7 U.S.C. § 136j(a)(2)(G) (2012), with Colorado Pesticide Applicators' Act, § 35-10-117(1)(i) (West 2016).

39. Compare 7 U.S.C. § 136j(a)(2)(G), with Colorado Pesticide Applicators' Act, § 35-10-117(1)(i).

40. Controlled Substances Act (CSA), 21 U.S.C. § 812(c)(10) (2012).

41. *Id.* § 812(b)(1).

42. *Id.* § 841(a)(1). A "controlled substance" includes substances in Schedules I–V of Part B of the CSA. *Id.* § 802(6).

43. *See id.* § 829(a)–(c).

44. *See* CSA, 21 U.S.C.A. § 811 (West 2013 & Supp. 2016).

45. *See* CSA, 21 U.S.C. § 812(b) (2012).

46. Compare *id.* § 812(b)(1)(A), with *id.* § 812(b)(2)(C).

medical use.⁴⁷

There have been various attempts to push federal agencies such as the Department of Justice and the Drug Enforcement Agency (DEA) to recognize the medicinal value of marijuana and reclassify it as a lower schedule drug under the CSA so that it may be used legally, at a minimum for medical purposes.⁴⁸ Unfortunately, as recently as August 2016, these attempts have been unsuccessful.⁴⁹ Thus, under federal law, marijuana remains classified as a Schedule I drug legally recognized as having no medical use, alongside substances such as heroin and LSD.⁵⁰ This classification remains, despite the U.S. Department of Health and Human Services (DHHS) owning a patent for the use of “[c]annabinoids as antioxidants and neuroprotectants,” which states that cannabinoids “are generally useful in the treatment of many oxidation associated diseases.”⁵¹

2. State-Led Legalization of Marijuana

In contrast to the treatment of marijuana at the federal level, a growing number of states have legalized marijuana for medical and recreational use.⁵² In Colorado, voters added Amendment 64 to the state constitution in 2012,

47. Compare *id.* § 812(b)(1)(C), (2)(B), with *id.* § 812(b)(3)(B).

48. See, e.g., *Ams. for Safe Access v. DEA*, 706 F.3d 438, 449 (D.C. Cir. 2013) (denying petition for review of the DEA’s denial to reschedule marijuana); *United States v. Pickard*, 100 F. Supp. 3d 981, 1003 (E.D. Cal. 2015) (rejecting—reluctantly—defendant’s argument that the CSA’s classification of marijuana as a Schedule I substance is “arbitrary” and therefore violates the Equal Protection Clause of the Fifth Amendment).

49. See *Denial of Petition to Initiate Proceedings to Reschedule Marijuana*, 81 Fed. Reg. 53,767, 53,840 (Aug. 12, 2016); *Denial of Petition to Initiate Proceedings to Reschedule Marijuana*, 81 Fed. Reg. 53,688, 53,688 (Aug. 12, 2016); see also *Ams. for Safe Access*, 706 F.3d at 452. The *Americans for Safe Access v. DEA* court found the DEA’s denial was proper because petitioners had only cited “peer-reviewed articles in support of their position, but they ha[d] not pointed to ‘adequate and well-controlled studies’ confirming the efficacy of marijuana for medicinal uses.” 706 F.3d at 452. The Author believes the failure of reclassification attempts is unfortunate because of the numerous scientific authorities that recognize the medicinal benefits of marijuana for patients with a variety of conditions. See *infra* notes 171–75 and accompanying text.

50. 21 U.S.C. § 812(c)(Schedule I)(a)(b)(10), (c)(Schedule I)(a)(c)(9), (c)(Schedule I)(a)(c)(10).

51. *Cannabinoids as Antioxidants & Neuroprotectants*, U.S. Patent No. 6,630,507 B1, col. 3, l. 16–17 (filed Apr. 21, 1999) (issued Oct. 7, 2003).

52. See *supra* note 2 and accompanying text.

legalizing the recreational use of marijuana within the state.⁵³

However, the constitutionality of state-led marijuana legalization has been challenged. Nebraska and Oklahoma filed a lawsuit against Colorado in 2014 challenging Colorado's marijuana laws as unconstitutional because of preemption by federal drug laws.⁵⁴ Though filed in the Supreme Court, the Court declined to hear the case after the Solicitor General of the United States issued an opinion recommending that it was not an appropriate case for original jurisdiction.⁵⁵ Regardless, many legal scholars who have studied the federalism dispute over states' power to enact marijuana laws contrary to federal drug laws believe the state marijuana laws are constitutional and will withstand preemption challenges.⁵⁶ Thus, the remaining legal hurdles for the marijuana industry will not come from preemption but from other issues, such as the use of pesticides on marijuana plants in violation of the pesticides' federally regulated labels.

III. THE BURNING PROBLEM FOR MARIJUANA GROWERS: UNSUPERVISED PESTICIDES

No pesticides are legally approved under the FIFRA for use with marijuana—making the application of any pesticide to marijuana plants illegal under federal law.⁵⁷ Furthermore, so long as marijuana remains classified as a Schedule I substance under the CSA, it is unlikely the EPA will approve any pesticides for marijuana plants or publish any substantial

53. See Blake & Finlaw, *supra* note 8, at 359 (“[F]ifty-five percent of Colorado voters approved” the ballot measure known as Amendment 64 on November 6, 2012.).

54. See Motion for Leave to File Complaint, Complaint, and Brief in Support, *Nebraska v. Colorado*, 136 S. Ct. 1034 (2016) (No. 144, Orig.), 2014 WL 7474136, at *6–7.

55. See *Nebraska v. Colorado*, 136 S. Ct. at 1034; Brief for United States as Amicus Curiae at 8, *Nebraska v. Colorado*, 136 S. Ct. 1034 (2016) (No. 144, Orig.) (“Entertaining the type of dispute at issue here—essentially that one State’s laws make it more likely that third parties will violate federal and state law in another State—would represent a substantial and unwarranted expansion of this Court’s original jurisdiction.”).

56. See, e.g., David S. Schwartz, *High Federalism: Marijuana Legalization and the Limits of Federal Power to Regulate States*, 35 *CARDOZO L. REV.* 567, 570, 573 (2013) (arguing that in the face of this “federalism crisis,” the “most faithful” approach for courts to take is treating “federal preemption . . . as a choice of law rule” to permit state officials to carry out the state laboratories of marijuana legalization). Further discussion of the federalism dispute is outside the scope of this Note, which instead focuses on existing public health concerns created by the disconnect between federal and state policies on marijuana.

57. VOELKER & HOLMES, *supra* note 11, at 3–4.

recommendations regarding the safe use of pesticides with marijuana plants.⁵⁸ Given the lack of federal regulation of pesticides and marijuana, there are few assurances that marijuana consumers are not exposing themselves to hazards the federal government seeks to protect consumers from with EPA pesticide regulations for other crops.⁵⁹ In fact, considering the various methods of marijuana consumption, marijuana treated with pesticides likely presents more health hazards to consumers than food crops or tobacco.⁶⁰ These risks present themselves most in the states like Colorado that have legalized marijuana under state law.

A. Colorado's Green Rush: The State of Marijuana in Colorado

Colorado's marijuana industry is thriving. Recreational sales became legal in 2014, and by the end of that year, combined sales of medical and recreational marijuana reached nearly \$700 million and 2,249 premises had been licensed for the marijuana industry, ranging from retail stores to testing facilities.⁶¹ In 2015, sales reached almost \$1 billion, exceeding \$996 million; in 2016, sales exceeded \$1 billion before December.⁶² By mid-2016, the number of premises licensed within the marijuana industry had reached 2,767.⁶³

58. See David Migoya & Ricardo Baca, *Colorado Yields to Marijuana Industry Pressure on Pesticides*, DENVER POST (Oct. 3, 2015), <http://www.denverpost.com/2015/10/03/colorado-yields-to-marijuana-industry-pressure-on-pesticides/> [hereinafter Migoya & Baca, *Colorado Yields*] (“The U.S. Environmental Protection Agency, which regulates pesticides, offered the state little advice about what to do because marijuana is an illegal crop under federal law.”).

59. See *supra* Part II.A.

60. See *infra* Part V.B (noting marijuana is both smoked and consumed orally).

61. BARBARA BROHL ET AL., MARIJUANA ENF'T DIV., COLO. DEP'T OF REVENUE, ANNUAL UPDATE 8 (2015), https://www.colorado.gov/pacific/sites/default/files/2014%20MED%20Annual%20Report_1.pdf; Migoya & Baca, *Colorado Yields*, *supra* note 58.

62. The Cannabist, *Colorado Marijuana Sales Top \$106 Million in November*, DENVER POST (Jan. 12, 2017), <http://www.denverpost.com/2017/01/12/colorado-marijuana-sales-november-2016/>; Ricardo Baca, *Colorado Marijuana Sales Skyrocket to More than \$996 Million in 2015*, CANNABIST (Feb. 9, 2016), <http://www.thecannabist.co/2016/02/09/colorado-marijuana-sales-2015-reach-996-million/47886/>.

63. BARBARA BROHL ET AL., MARIJUANA ENF'T DIV., COLO. DEP'T OF REVENUE, MED 2016 MID-YEAR UPDATE 3 (2017), <https://www.colorado.gov/pacific/sites/default/files/Final%20Mid%20year%202016.pdf>.

B. *Colorado's Regulatory Rush: Developing Pesticide-Safety Regulations Out of Thin Air*

Colorado began exploring pesticide regulations specific to its marijuana industry in spring 2015, and in October 2015 the Colorado Department of Agriculture (CDA) proposed new rules that would heavily restrict what pesticides could be used on marijuana plants in Colorado.⁶⁴ These rules, adopted February 10, 2016, were predicted to narrow the number of state-approved pesticides for use on marijuana from around 200 to 75.⁶⁵ The new marijuana-specific pesticide regulations provide for five conditions under which pesticides may be used on marijuana in the state, but because there are no pesticides approved by the EPA for marijuana, the regulations effectively create two narrow categories of state-approved pesticides for marijuana: (1) “minimum risk” pesticides that are exempt from registration with the EPA under the FIFRA and (2) pesticides that must be registered under the FIFRA but are also deemed safe by the EPA for use on tobacco and on other crops intended for human consumption.⁶⁶ The rules allow any pesticide that was not expressly labeled for human-consumption crops alternatively to meet that requirement if the pesticide was registered with the EPA and all the pesticide’s ingredients were exempt from maximum tolerance levels under the FIFRA.⁶⁷ The rules also allow pesticides whose labels specifically allow for use on cannabis (of which there will be none unless pesticides begin to be approved under the FIFRA for cannabis) or pesticides that are approved under a FIFRA section 24(c) “Special Local Needs” waiver for use on cannabis (of which there currently are none).⁶⁸

Prior to these revised regulations, the State of Colorado had been working to support its newly legalized marijuana industry, while balancing public safety concerns about pesticide usage. In spring of 2015, the CDA

64. David Migoya & Ricardo Baca, *Colorado Proposes Stricter Rules on Pesticides for Growing Pot*, DENVER POST (Oct. 5, 2015), <http://www.denverpost.com/2015/10/05/colorado-proposes-stricter-rules-on-pesticides-for-growing-pot/> [hereinafter Migoya & Baca, *Colorado Proposes Stricter Rules*].

65. 8 COLO. CODE REGS. § 1203-2:17 (LexisNexis 2016) (exempt under FIFRA § 25(b)); Migoya & Baca, *Colorado Proposes Stricter Rules*, *supra* note 64.

66. *See* 8 COLO. CODE REGS. § 1203-2:17.04. Minimum risk pesticides are essentially natural pesticides containing only certain listed ingredients, such as cedar oil, citric acid, rosemary, and salt. 40 C.F.R. § 152.25(f) (2016).

67. *See* 8 COLO. CODE REGS. § 1203-2:17.04 (tolerance levels as set out in 40 C.F.R. § 180).

68. *Id.*; *see also infra* Part V.C.

began publishing policies regarding pesticide use on marijuana and creating a list of pesticides that the CDA believed were safe for use on marijuana plants.⁶⁹ Despite these early attempts at ensuring safe regulation of pesticides, in fall of 2015, the city of Denver initiated repeated recalls on marijuana products that had been treated with unsafe pesticides—with Denver’s Department of Environmental Health issuing 29 separate recalls in only a year, as of November 2016.⁷⁰

Following Denver’s announcement of recalls, in November 2015, Governor John Hickenlooper issued an executive order directing three state agencies (the CDA, Colorado Department of Public Health and Environment, and Colorado Department of Revenue) to “address threats to public safety posed by marijuana contaminated by pesticide.”⁷¹ In the year following the signing of the executive order, state officials from the Colorado Marijuana Enforcement Division had issued 33 recalls of marijuana products that were grown with unapproved pesticides.⁷²

In addition to the unpredictable challenge presented by these recalls, Colorado’s marijuana industry has faced legal challenges in court by consumers who want to prevent the industry from going “unchecked” over its use of pesticides.⁷³ In October 2015, two Colorado residents sued the largest Colorado marijuana grower for breach of implied promise after the grower sold them marijuana allegedly treated with pesticides that were unapproved under the CDA’s guidelines.⁷⁴ The plaintiffs alleged that the

69. See Migoya & Baca, *Colorado Yields*, *supra* note 58.

70. See Ricardo Baca, *Check Your Stash: Are You Consuming Pesticide-Peppered Pot? Full Recall List*, CANNABIST (Dec. 4, 2015), <http://www.thecannabist.co/2015/12/04/pesticide-pot-recall-list-marijuana/44711/> [hereinafter Baca, *Check Your Stash*]. It is worth noting that at least one of the recalls was initiated voluntarily by the grower, Avicenna Products. *Avicenna Products Voluntarily Recalls Medical Marijuana Products Due to Pesticide Residues*, DENVER DEP’T ENVTL. HEALTH (May 13, 2016), <https://www.denvergov.org/content/denvergov/en/environmental-health/about-us/newsroom/2016/AvicennaProductsRecall.html>.

71. Colo. Exec. Order No. D 2015-15 (Nov. 12, 2015), https://www.colorado.gov/pacific/sites/default/files/atoms/files/D%202015-015%20MJ%20Pesticides_2.pdf.

72. See Baca, *Check Your Stash*, *supra* note 70 (as of November 2016).

73. See David Migoya & Ricardo Baca, *Colorado’s Largest Pot Grower Sued by Two Consumers over Pesticide Use*, DENVER POST (Oct. 5, 2015), <http://www.denverpost.com/2015/10/05/colorados-largest-pot-grower-sued-by-two-consumers-over-pesticide-use/> (The plaintiffs’ attorney stated, “In a larger sense they’re saying the marijuana industry can’t go on unchecked and someone has to do something to stop these people from using Eagle 20 and other harmful pesticides . . .”).

74. Plaintiffs’ Class Action Complaint for Damages and Injunctive Relief at 1–2,

marijuana they bought was treated with Eagle 20, a pesticide they claimed turns to “poisonous hydrogen cyanide” when smoked.⁷⁵ The plaintiffs sought an injunction requiring the grower to stop using Eagle 20 and similar pesticides and sell its products with pesticide warnings.⁷⁶

IV. THE TRIPLE THREAT AGAINST THE MARIJUANA INDUSTRY

The challenges facing the marijuana industry are threefold. First, the federal government prevents the majority of potential scientific research on marijuana and its cultivation using pesticides.⁷⁷ Second, the future of marijuana’s legal status is uncertain, which carries the possibility that sales in states with legalized marijuana industries could be shut down at any time if the federal government began to prosecute these sales under the CSA.⁷⁸ Finally, as a result of the first and second problems, it is unlikely any profit-conscious pesticide manufacturer will develop a pesticide intended for use on marijuana plants that the manufacturer could seek to register under the FIFRA for legal application on marijuana plants.⁷⁹

A. *The Federal Government’s Prevention of Marijuana Research*

The U.S. Government has “a monopoly on research-grade marijuana.”⁸⁰ Under the authority of the CSA, the DEA has licensed only one institution to grow marijuana for research: the University of Mississippi.⁸¹ Therefore, there is a limited supply of research-grade

Flores v. LivWell, Inc., No. 2015CV33528 (Colo. Dist. Ct., Denver Cty. 2016) [hereinafter Flores Class Action Complaint], <https://mjbizdaily.com/wp-content/uploads/2015/10/2015-10-05-04-49-31-Flores-v.-LiveWell-Complaint-FINAL.pdf>. The judge ultimately dismissed the case because the plaintiffs themselves were not actually harmed and had used the marijuana without consequence. Andrew Wheeler, *Consumer Lawsuit Filed Against Legal Marijuana Grower*, LLRC BLOG (Feb. 15, 2016), <http://llrcblog.com/tag/livwell-eagle-20-lawsuit/>.

75. See Flores Class Action Complaint, *supra* note 74, at 3.

76. *Id.* at 20.

77. See *infra* Part IV.A.

78. See *infra* Part IV.B.

79. See *infra* Part IV.C.

80. Ruth C. Stern & J. Herbie DiFonzo, *The End of the Red Queen’s Race: Medical Marijuana in the New Century*, 27 QLR 673, 707 (2009).

81. NIDA’s Role in Providing Marijuana for Research, NAT’L INST. ON DRUG ABUSE, <http://www.drugabuse.gov/drugs-abuse/marijuana/nidas-role-in-providing-marijuana-research> (last updated Aug. 2016). According to the NIDA, the DEA has only licensed one facility to grow research-grade marijuana due to the CSA’s “annual aggregate production quotas,” which are part of implementing the United Nations’ 1961

marijuana and most private institutions, such as pharmaceutical companies or pesticide manufacturers, are denied access to that supply, which hinders their ability to research marijuana.⁸²

Since 1999, there have only been 17 independently funded research projects cleared through the National Institute on Drug Abuse (NIDA) to receive this research-grade marijuana.⁸³ At least as of August 2016,⁸⁴ researchers applying for research-grade marijuana, particularly for use in medical clinical studies, face an arduous process in which they must be approved by four administrative agencies: the Food and Drug Administration (FDA), the NIDA, the DHHS, and the DEA.⁸⁵ The FDA must approve the medical clinical study, the NIDA must approve the request for marijuana and send the request to the DHHS for final recommendation, and the DEA must grant a research registration for marijuana as a Schedule I substance.⁸⁶ Additional hurdles to researching a Schedule I substance such as marijuana, compared with a Schedule II substance, include: (1) renewal of research registration annually, rather than every three years; (2) registrations that are both protocol and substance specific, rather than allowing research for all protocols and substances in Schedule II; and (3)—an obstacle specific to marijuana research—in order to obtain marijuana from the University of Mississippi's grow site, researchers must either be funded by a National Institute of Health (NIH) grant, or if the study is otherwise funded, pass a review process equivalent to the NIH grant review

Single Convention on Narcotic Drugs. *Id.* However, this may change in the near future. See *infra* text accompanying note 84.

82. See Stern & DiFonzo, *supra* note 80, at 706–07.

83. *Independently Funded Human Studies Approved to Receive Marijuana – 1999 to Present*, NAT'L INST. ON DRUG ABUSE, <http://www.drugabuse.gov/drugs-abuse/marijuana/independently-funded-studies-receiving-research-grade-marijuana-1999-to-present> (last updated Mar. 2016).

84. On August 12, 2016, the DEA announced—on the same day that it denied two requests for rescheduling marijuana—“a new approach” to marijuana research that would “allow additional marijuana growers to apply to become registered with DEA,” therefore, allegedly “fully support[ing] expanding research into the potential medical utility of marijuana and its chemical constituents.” Applications to Become Registered Under the Controlled Substances Act to Manufacture Marijuana to Supply Researchers in the United States, 81 Fed. Reg. 53,846, 53,846 (Aug. 12, 2016).

85. Alexander W. Campbell, Note, *The Medical Marijuana Catch-22: How the Federal Monopoly on Marijuana Research Unfairly Handicaps the Rescheduling Movement*, 41 AM. J.L. & MED. 190, 200 (2015).

86. See *id.* at 200–02.

process.⁸⁷

Critics minimize the difficulties of obtaining research-grade marijuana by claiming that there has been sufficient supply for “all marijuana-related studies to date.”⁸⁸ However, such arguments fail to recognize that the limited supply of marijuana for scientific research, paired with the more difficult approval process for Schedule I substance research, is likely deterring researchers from even applying for consideration in a share of that marijuana supply.⁸⁹ At least one administrative judge has recognized these conditions and ruled that the NIDA-controlled marijuana supply was not adequate for researchers, stating, “NIDA’s system for evaluating requests for marijuana for research has resulted in some researchers who hold DEA registrations and requisite approval from [DHHS] being unable to conduct their research because NIDA has refused to provide them with marijuana.”⁹⁰

Though marijuana remains classified as a Schedule I substance by the federal government, which means the government can place “tight restrictions” on research,⁹¹ similar obstacles are not imposed on the research of other Schedule I drugs such as heroin, LSD, and ecstasy.⁹² The burdens and bans placed on marijuana research by the federal government are not justified by its Schedule I status. Instead, these burdens are a product of marijuana’s history of public suspicion and criminalization and of its continued stigmatization.⁹³ For example, the DEA rejected one professor’s petition to grow marijuana for medical studies based on “the risk of

87. Kevin A. Sabet, *Much Ado About Nothing: Why Rescheduling Won’t Solve Advocates’ Medical Marijuana Problem*, 58 WAYNE L. REV. 81, 97–99 (2012).

88. *Id.* at 99 (citing Lyle E. Cracker, Denial of Application, 74 Fed. Reg. 2101, 2104 (Jan. 14, 2009)).

89. *See id.* at 97–98.

90. *See* Lyle E. Cracker, Denial of Application, 74 Fed. Reg. at 2013 (citation omitted) (rejecting the legal conclusion of the administrative judge and her recommendation to grant application for petitioner to register as a marijuana manufacturer).

91. Mark S. Lally, *What’s in Store for Delaware’s First Medical Cannabis Dispensary*, DEL. LAW., no.1, 2015, at 20, 21.

92. *See* Stern & DiFonzo, *supra* note 80.

93. *See id.* at 681–84, 706. Starting in the 1930s, marijuana was cast as “a prelude to violence” which began to create “public antipathy” that has endured for over 60 years; in 1992, a deputy DEA administrator called claims that marijuana had medicinal value “false, dangerous, and cruel.” *Id.* (citations omitted). For a detailed history of the development of marijuana stigmatization, see *id.* at 682–92.

oversupply, which in turn increases the risk of diversion.”⁹⁴ These concerns are applicable to research done with any other Schedule I substance and do not justify the denial of research when scientists and doctors continue to recognize the possible medical benefits of marijuana.⁹⁵ In denying research petitions, the DEA and FDA have ignored scientific studies, policy papers by the American College of Physicians, and recommendations of their own administrative judges supporting the recognition of marijuana’s medical benefits.⁹⁶ The DEA’s refusal to issue sufficient marijuana for medical studies makes it further unlikely that marijuana will be issued for studies on the effects of pesticides on marijuana.

B. Marijuana’s Hazy Legal Status

There have been many challenges to the development of a legitimate business framework for the marijuana industry: notably, the reluctance of the national banking industry to provide services to the marijuana industry.⁹⁷ These challenges largely stem from the uncertainty of marijuana’s future legality, which is primarily due to the lack of federal support for legalization.

In all branches of the federal government, marijuana legalization has received only minimal support. The Supreme Court of the United States held that Congress has power to prosecute the private cultivation of marijuana, despite being legalized under a state’s medical marijuana law.⁹⁸ Though some elected representatives in Congress have introduced legislation favorable to legalizing marijuana, Congress as a whole has repeatedly rejected these attempts at reform.⁹⁹ Finally, while the Executive

94. *See id.* at 707 n.268 (citing Lyle E. Cracker, Denial of Application, 74 Fed. Reg. at 2133).

95. *See id.* at 708.

96. *See id.* at 706–09.

97. For further discussion of the banking difficulties of the marijuana industry, see Matt Richtel, *The First Bank of Bud: Marijuana Industry in Colorado, Eager for Its Own Bank, Waits on the Fed*, N.Y. TIMES (Feb. 15, 2015), http://www.nytimes.com/2015/02/08/business/marijuana-industry-in-colorado-eager-for-its-own-bank-waits-on-the-fed.html?_r=0.

98. *Gonzales v. Raich*, 545 U.S. 1, 20 (2005) (holding that Congress’s power to regulate commerce may include the private cultivation of a commodity like marijuana).

99. *See, e.g.*, Medical Marijuana Patient Protection Act, H.R. 5842, 110th Cong. (2008) (killed in committee); States’ Rights to Medical Marijuana Act, H.R. 2087, 109th Cong. (2005) (killed in committee); *see also* Paul Lewis, *A Gateway to Future Problems: Concerns About the State-by-State Legalization of Medical Marijuana*, 13 U.N.H. L. REV., no. 1, 2015, at 49, 63 (citing 12 defeated proposals).

Branch under President Barack Obama supported states acting as laboratories for marijuana legalization through policies such as the Ogden Memo and prosecutorial discretion, this support could disappear with President Donald Trump's Administration.¹⁰⁰

C. *The Lack of Pesticides Approved for Marijuana*

As previously noted, no pesticides are legally approved under the FIFRA for application to marijuana, making the application of any pesticide to marijuana illegal under federal law.¹⁰¹ Nonetheless, many growers use pesticides to protect their marijuana plants.¹⁰² In fact, researchers and analysts recognize that pesticide use by marijuana cultivators across legalized states has become "the norm."¹⁰³ Pesticides designed for safe use on marijuana are potentially a huge market, as the marijuana industry continues to grow rapidly.¹⁰⁴ Yet, in an environment of uncertainty over marijuana's future legal status, with little science-based evidence about which pesticides may be safe for use on marijuana, few pesticide manufacturers are likely to attempt to register or develop pesticides for use on marijuana.¹⁰⁵ Therefore, most pesticide usage will remain illegal under federal law until the federal government takes action.

Despite the federal illegality of pesticide usage in the marijuana industry, states that have legalized marijuana should attempt to protect their marijuana-consuming citizens with state-enacted regulations for the use of pesticides by marijuana growers. Unfortunately, though Colorado and other states may put forth recommendations for pesticides that are believed to be safe to use on marijuana, the federal government's barriers to scientific

100. See Lewis, *supra* note 99, at 82–85. For a discussion of the problems with the Ogden Memo and federal prosecutorial discretion with regard to marijuana, see *id.* at 86–97.

101. See *supra* note 57 and accompanying text.

102. VOELKER & HOLMES, *supra* note 11; Sullivan et al., *supra* note 16. For further explanation of a grower's choice to use pesticides, see *infra* Part V.A.

103. Memorandum from Tonya D. Lindsey, Senior Policy Analyst, Cal. Research Bureau to Julianna Thomas, Capitol Dir., Office of Assemblymember Linda Halderman 2 (Apr. 10, 2012) (quoting Dr. Lindsey's emails with Dr. Anthony Silvaggio, Professor at Humboldt State University), http://library.humboldt.edu/humco/holdings/CAMP/CRB_Pesticides_on_Medical_Marijuana_Report.pdf.

104. See *supra* Part III.A.

105. See David Migoya & Ricardo Baca, *Colorado Puts Onus on Industry to Prove Pesticides Are Safe on Pot*, DENVER POST (Oct. 17, 2015), <http://www.denverpost.com/2015/10/17/colorado-puts-onus-on-industry-to-prove-pesticides-are-safe-on-pot/>.

research with marijuana prevents these recommendations from being research-based and tested.¹⁰⁶ Therefore, in the long term, the public health risks presented by pesticide use in the marijuana industry will likely only disappear if the federal government takes action—either by lifting barriers to scientific research or by reclassifying marijuana under the CSA and permitting the EPA to approve pesticides for use on the plant.

V. SOLUTIONS

This Note sets forth several possible solutions for ensuring that marijuana consumption is safe. First, state regulators could prohibit marijuana growers from using any pesticides on their plants and permit only organic, pesticide-free growing methods.¹⁰⁷ Second, regulators could approve pesticides already approved for tobacco plants for use on marijuana plants, relying on the similarities between them—mainly that both are smoked—to address the concerns, like those voiced in the Colorado plaintiffs’ lawsuit,¹⁰⁸ about pesticide combustion during smoking.¹⁰⁹ Third, states could apply to the EPA for FIFRA section 24(c) waivers that would legally approve some pesticides to be used on marijuana plants and bring growers into compliance with federal pesticide law.¹¹⁰

While these are all plausible solutions, which will be further examined below, the best long-term solution would be reclassification of marijuana under the CSA by the federal government because it would allow for more open research of marijuana, which would improve the scientific basis for any future regulations regarding pesticide use on the plants.¹¹¹ However, until the federal government takes action, Colorado’s revised marijuana-specific pesticide regulations are a beneficial solution for reducing the risks to individuals consuming commercially grown marijuana.¹¹²

A. *Organic, Pesticide-Free Growing*

The best way to avoid pesticide consumption would be to guarantee

106. *See supra* Part IV.A.

107. *See infra* Part V.A.

108. *See supra* notes 74–76 and accompanying text.

109. *See infra* Part V.B.

110. *See infra* Part V.C.

111. *See infra* Part V.D.

112. *See supra* Part III.B.

that pesticides are not on marijuana plants at all.¹¹³ Commercial growers abroad have proven that marijuana can grow successfully and in large quantities without pesticides by using organic farming practices like “biocontrols,” such as predatory insects and beneficial microorganisms.¹¹⁴ However, in the United States, marijuana cannot legally be classified as “organic” because the term is federally regulated and the United States Department of Agriculture (USDA) does not recognize marijuana as a legal crop.¹¹⁵

Despite the legal technicality preventing marijuana from being labeled as *organic*, several organizations are working to develop other certifications that marijuana growers could use to market their crops as pesticide-free.¹¹⁶ Clean Green Certified is a California-based certification program run by a lawyer who is also an accredited organic certifier for the USDA.¹¹⁷ Since 2004, Clean Green has been certifying marijuana-growing operations that meet requirements for annual pesticide testing, carbon footprint reduction, water conservation, and fair labor practices.¹¹⁸ To date, Clean Green has certified three Colorado growers: Maggie’s Farm in Colorado Springs, New Amsterdam Organics in Denver, and Colorado Cultivars in Eaton.¹¹⁹ Additionally, a new Denver-based organization, the Organic Cannabis Association, is soon to launch its own certification program for pesticide-free marijuana.¹²⁰ In the 2016 Colorado legislative session, two Colorado state representatives, Representative Jonathan Singer of Longmont and Representative KC Becker of Bolder, introduced a bill to create a program run by the CDA to certify retail marijuana growers as “pesticide-free”; however, this bill was “postponed indefinitely” in the Colorado State Senate.¹²¹

113. Sullivan et al., *supra* note 16, at 5.

114. VOELKER & HOLMES, *supra* note 11, at 14.

115. Emilie Rusch, *Cannabis Producers Have Legal Alternatives to “Organic” Label*, DENVER POST (Sept. 25, 2015), <http://www.denverpost.com/2015/09/25/cannabis-producers-have-legal-alternatives-to-organic-label/>.

116. *Id.*

117. *About Us*, CLEAN GREEN CERTIFIED (2015), <http://cleangreencert.org/home/about-us/>; Rusch, *supra* note 115.

118. Rusch, *supra* note 115.

119. *Colorado*, CLEAN GREEN CERTIFIED, http://www.cleangreencert.org/business-directory/wpbdp_category/colorado/ (last visited Nov. 11, 2016).

120. Rusch, *supra* note 115.

121. Pesticide-Free Cannabis Certification Program, H.B. 16-1079, 70th Gen. Assemb., 2d Reg. Sess. (Colo. 2016),

Unfortunately, organic marijuana growing is not likely to succeed as a mainstream solution for reducing the risks of human pesticide consumption because of industry pushback. While some marijuana growers are leading the way for organic growing practices, others believe it would be “impossible” to run large-scale marijuana productions without using pesticides.¹²² Growers who have tried natural crop management have been forced to destroy an entire greenhouse room of plants when the space became infested with common plagues of marijuana, such as two-spotted spider mites, mildew, and root rot, despite thorough staff inspections multiple times a week and attempts to isolate infected plants.¹²³

Although marijuana is not necessarily more susceptible to pests than other plants,¹²⁴ many industry growers believe that chemicals are necessary to combat the pests and mildews that can quickly spread among plants with a closely grown crop like marijuana.¹²⁵ In a budding industry, particularly one struggling to finance itself,¹²⁶ many growers are not willing to take the risk of losing an entire greenhouse room of marijuana plants, which could retail at \$250,000 or more.¹²⁷ Many growers seeking to develop marijuana into a high-production agricultural industry would present considerable pushback if regulators tried to force them to stop using pesticides and risk losing their crop yield.¹²⁸ Initial attempts by states to approve pesticides for marijuana growers did not include approval of “the synthetic pesticides that most conventional growers use on wheat or apples or corn or just about any crop.”¹²⁹ This illustrates that other agricultural growers are not facing the same stringent restrictions on their pesticide usage. Forcing less effective—

http://leg.colorado.gov/sites/default/files/documents/2016a/bills/1079_01.pdf; see *Votes for - HB16-1079*, COLO. GEN. ASSEMBLY, <http://www.leg.state.co.us/CLICS/CLICS2016A/csl.nsf/BillFoldersHouse?OpenFrameSet> (choose “House Bills 1051-1100” in the “Select Bill Range” dropdown menu; click the “GO->” icon; follow the “Votes” link associated with “HB 16-1079”).

122. See Warner, *supra* note 7.

123. *Id.*

124. Robert Bergman, *How to Get Rid of Pests and Bugs on Marijuana Plants*, WEED BLOG (Sept. 9, 2014, 10:51 AM), <http://www.theweedblog.com/how-to-get-rid-of-pests-and-bugs-on-marijuana-plants/>.

125. Warner, *supra* note 7; see also VOELKER & HOLMES, *supra* note 11.

126. See *supra* note 97 and accompanying text (mentioning the difficulties the marijuana industry has faced when interacting with the banking industry).

127. See Warner, *supra* note 7.

128. See Migoya & Baca, *Colorado Proposes Stricter Rules*, *supra* note 64.

129. See Warner, *supra* note 7 (quoting Erik Johansen).

or at least less engineered—growing methods upon the marijuana industry could lead to growers abandoning the industry.¹³⁰

Therefore, any regulatory program will likely benefit from greater compliance, and not detrimentally affect the success of the marijuana industry, if it permits growers to use pesticides beyond natural biocontrols. The pursuit of pesticide-free certifications will complement a pesticide regulatory system but only for any growers that elect to pursue organic growing.

B. Tobacco-Approved Pesticides

By initial comparison, it appears that those pesticides approved federally for use on tobacco plants would be a good solution for use on marijuana since both crops are smoked. Even the EPA has noted that the pesticides most likely to be approved for use on marijuana will be those approved for use on tobacco.¹³¹ However, two main differences between marijuana and tobacco prevent simply approving tobacco-safe pesticides for marijuana: tobacco is a “non-food” crop under EPA regulations¹³² and, unlike tobacco, marijuana is commonly smoked without a filter.¹³³ These two differences place marijuana consumers at a significantly greater risk of ingesting and inhaling pesticide chemicals.

130. See *id.* One marijuana consultant described the situation: “Frankly, if you talk to anybody who is in high-production agriculture and say, ‘I am going to take away most of your pesticides,’ they will say, ‘I am selling my farm.’” *Id.* (quoting Kurt Badertscher).

131. See Letter from Jack E. Housenger, Dir., Office of Pesticide Programs, U.S. EPA, to Mitchell Yergert, Dir., Div. of Plant Indus., Colo. Dep’t of Agric. (May 19, 2015) [hereinafter EPA Letter], <https://www.colorado.gov/pacific/agplants/atom/21236> (stating which pesticides are most likely to be approved under a FIFRA section 24(c) “Special Local Needs” waiver).

132. U.S. GEN. ACCOUNTING OFFICE, GAO-03-485, PESTICIDES ON TOBACCO: FEDERAL ACTIVITIES TO ASSESS RISKS AND MONITOR RESIDUES 3 (2003) [hereinafter GAO REPORT, PESTICIDES ON TOBACCO], <http://www.gao.gov/new.items/d03485.pdf>.

133. See, e.g., Rosa Ruchlemer et al., *Inhaled Medicinal Cannabis and the Immunocompromised Patient*, 23 SUPPORTIVE CARE CANCER 819, 819 (2014), <http://link.springer.com/journal/520/23/3/page/2> (follow the “Download PDF” link associated with the article) (discussing marijuana smoked through vaporizer). The Author recognizes that tobacco, like marijuana, is consumed by some users in methods that do not involve a filter, for example, chewing tobacco, but filtered cigarettes appear to be the most common method of tobacco consumption in the United States. See *Tobacco*, CTR. FOR SUBSTANCE ABUSE RESEARCH, <http://www.cesar.umd.edu/cesar/drugs/tobacco.asp> (last updated Oct. 29, 2013).

1. *Marijuana: Not Just for Smoking*

The EPA takes extra precaution with any food crop that is cultivated with pesticides by setting maximum tolerance levels for the pesticide residues that may be left on the consumer product.¹³⁴ Because tobacco is not considered a food crop under the FFDCA, “[w]hile EPA regulates the *specific pesticides* that may be used on tobacco . . . EPA does not otherwise regulate *residues of pesticides* approved for use on tobacco”—meaning there is no regulation of the pesticide residues that remain on tobacco products when consumed by individuals.¹³⁵ Though tobacco pesticides may be regulated for safe smoking, they are not regulated for safe oral consumption.¹³⁶

In contrast to tobacco, marijuana is often consumed by oral ingestion through what are commonly called “edibles,”¹³⁷ making marijuana more similar to a food crop. The Colorado Code of Regulations refers to orally ingested marijuana as “edible retail marijuana products” and defines these as products “which [are] intended to be consumed orally, including but not limited to, any type of food, drink, or pill.”¹³⁸ The EPA has indicated that any pesticide approved for use on marijuana will have to be safe for use on food crops.¹³⁹ Given the special precautions that the FFDCA places on regulating pesticides for orally consumed food crops and the extra health risks already posed by the “highly variable” nature of edible marijuana,¹⁴⁰

134. See FFDCA, 21 U.S.C. § 346a(a)(1)(A) (2012); see also *supra* Part II.A.1.b. (discussing FFDCA requirements).

135. GAO REPORT, PESTICIDES ON TOBACCO, *supra* note 132.

136. See Sullivan et al., *supra* note 16, at 1 (noting tobacco is not a food crop, meaning it is only regulated by the EPA).

137. See Jessica B. Hancock-Allen et al., *Notes from the Field: Death Following Ingestion of an Edible Marijuana Product—Colorado, March 2014*, 64 MORBIDITY & MORTALITY WKLY. REP. 771, 771 (2015), <https://www.cdc.gov/mmwr/pdf/wk/mm6428.pdf> (“An estimated 45% of Colorado’s marijuana sales involve edible marijuana, including THC-infused food, drink, and pills.”); see also *Edible*, URB. DICTIONARY, <http://www.urbandictionary.com/define.php?term=Edible> (last visited Mar. 11, 2016) (defining edibles as “[a]ny edible product that contains THC,” and listing common edibles such as brownies).

138. 1 COLO. CODE REGS. § 212-2.103 (LexisNexis 2016).

139. See EPA Letter, *supra* note 131.

140. Hancock-Allen et al., *supra* note 137, at 771–72. In 2015, the Center for Disease Control and Prevention reported “potential danger associated with recreational edible marijuana use” because oral ingestion delivers effects that are “highly variable” and more likely to be delayed compared with smoking. *Id.* at 771. Thus, an individual consuming marijuana edibles is likely to consume multiple servings rapidly, leading to

oral consumption of marijuana prevents reliance on tobacco-safe pesticides being approved for safe use on marijuana.

2. *Marijuana: Unfiltered*

Marijuana consumption is further distinct from tobacco consumption because marijuana is commonly smoked without a filter through unfiltered pipes, vaporizers, and other methods.¹⁴¹ Smoking through a filter is “critical in capturing and reducing pesticide residues.”¹⁴² A 2013 study found that up to 70 percent of pesticide chemicals applied to marijuana remain on the plant and are transferred into the smoke inhaled by smokers.¹⁴³ In contrast, a 2002 study of filtered tobacco cigarettes found that only 2 to 16 percent of pesticides remained in the smoke that is inhaled by a consumer.¹⁴⁴ With up to 70 percent of pesticides being inhaled by a marijuana smoker, there is an increased risk of the health complications associated with high pesticide exposure, compared with tobacco smokers.¹⁴⁵ Health complications that result from inhalation of pesticides through smoking include “moderate to severe respiratory and neurological damage” and even death.¹⁴⁶

In sum, the risks presented by edible and unfiltered smoked marijuana consumption prevent the rubber-stamping of approval of tobacco pesticides for use on marijuana to resolve the risks associated with inadvertent pesticide consumption.

C. *The FIFRA Section 24(c) “Special Local Needs” Waiver*

Section 24(c) of the FIFRA provides for an exception to the traditional

“accidental overconsumption,” “higher THC concentration, greater intoxication, and an increased risk for adverse psychological effects.” *Id.* at 771–72.

141. Ruchlemer et al., *supra* note 133 (studying marijuana smoked through vaporizer); Sullivan et al., *supra* note 16, at 4 (studying marijuana smoked through filtered water pipe, nonfiltered water pipe, and glass pipe).

142. Sullivan et al., *supra* note 16, at 5.

143. *Id.* (reporting pesticide recoveries ranging from 60.3 to 69.5 percent with glass pipes, 42.2 to 59.9 percent with unfiltered water pipe, and 0.08 to 10.9 percent with filtered water pipe).

144. *Id.* (citing J. Cai et al., *Determination of the Pyrethroid Residents in Tobacco and Cigarette Smoke by Capillary Gas Chromatography*, 964 J. CHROMATOGRAPHY A 205, 205–11 (2002)).

145. *Id.* at 4, 5.

146. GOA REPORT, PESTICIDES ON TOBACCO, *supra* note 132, at 2.

pesticide registration process to “meet special local needs.”¹⁴⁷ A special local need is “an existing or imminent pest problem within a State.”¹⁴⁸ To receive a FIFRA section 24(c) waiver for non-registered pesticide use, the state—rather than the pesticide manufacturer—applies to the EPA for a waiver.¹⁴⁹

In early 2015, the Colorado Department of Agriculture made an inquiry to the EPA regarding the possibility of a FIFRA section 24(c) waiver to resolve the unapproved use of pesticides on marijuana plants in Colorado.¹⁵⁰ The EPA’s response indicated that a section 24(c) waiver might be granted if Colorado could identify an existing federally registered pesticide that is already approved for use on (1) food, (2) tobacco, and (3) crops with similar “agronomic characteristics” to cannabis and is approved with (4) the same application method in (5) the same type of structure or site as cannabis is grown.¹⁵¹

While these proposed requirements for a FIFRA section 24(c) waiver would give more protection to consumers than simply approving tobacco-safe pesticides for use on marijuana, there are several problems with using section 24(c) waivers to address the approval of pesticides for marijuana. First, it will be difficult for Colorado, or any state, to identify a pesticide that meets all of the EPA’s suggested criteria for a pesticide suitable for a section 24(c) waiver for marijuana.¹⁵² As already stated, marijuana is a unique crop because it is consumed both orally and by smoking.¹⁵³ Furthermore, unlike with other crops, there is no guidance from state university agricultural departments or the USDA, and there is only a small amount of guidance from the EPA to use as a starting point in finding existing pesticides safe for marijuana.¹⁵⁴

147. FIFRA, 7 U.S.C. § 136v(c)(1) (2012).

148. 40 C.F.R. § 162.151 (2016).

149. See 7 U.S.C. § 136v. Typically, the pesticide manufacturer applies to the EPA for approval of a pesticide after conducting research to develop the necessary data for application. See *supra* note 24 and accompanying text.

150. See EPA Letter, *supra* note 131.

151. *Id.*

152. See Warner, *supra* note 7 (“It doesn’t help that unlike other Special Local Need registrations, states and manufacturers can’t rely on the expertise of state university agricultural departments or the U.S. Department of Agriculture, thanks to marijuana’s federal illegality.”).

153. See *infra* Part V.B (explaining the differences in consumption between tobacco and marijuana).

154. See Migoya & Baca, *Colorado Yields*, *supra* note 58; Warner, *supra* note 7.

Secondly, FIFRA section 24(c) waivers would only be capable of addressing marijuana pesticide regulation on a small scale. A “special local needs” waiver is only valid within the state that requests it.¹⁵⁵ If more than five states request a section 24(c) waiver for the same need, the EPA will begin to question whether the need qualifies as a “special local need” because the waivers are not designed for regional or national problems.¹⁵⁶ If 15 states request the same waiver, the EPA will not grant any more waivers for that need.¹⁵⁷ With 45 states already permitting legal use of marijuana in some form,¹⁵⁸ FIFRA section 24(c) waivers would provide the safety that consumers need only if 15 or fewer states were cultivating all the marijuana plants to be consumed. Therefore, the scope of protection that could be created for marijuana consumers through section 24(c) waivers is limited.

Lastly, this solution would put a burden on the states to identify and request a waiver for an existing pesticide. Though a section 24(c) waiver takes less time and money for approval than a full pesticide registration, states are unlikely to take on that burden and cost without the partnership of a private company.¹⁵⁹ Such a partnership to cover the expenses of identifying a compatible pesticide is unlikely given that the industry’s uncertain legal status and future preclude many private businesses from getting involved.¹⁶⁰

D. A Better Long-Term Solution: Reclassification of Marijuana Under the Controlled Substances Act

Marijuana could—and should—be reclassified as a Schedule II or III substance under the CSA. Marijuana’s Schedule I status is the “ultimate barrier” to transitioning even partial legalization to the federal level.¹⁶¹ To be reclassified as a Schedule II or III substance, marijuana must be shown to have a “currently accepted medical use.”¹⁶² According to many medical

155. See FIFRA, 7 U.S.C. § 136v (2012); *Guidance on FIFRA 24(c) Registrations*, U.S. EPA, <http://www2.epa.gov/pesticide-registration/guidance-fifra-24c-registrations> (last updated Dec. 27, 2016).

156. *Guidance on FIFRA 24(c) Registrations*, *supra* note 155.

157. *See id.*

158. *See supra* text accompanying note 2.

159. Warner, *supra* note 7.

160. *See id.*

161. Campbell, *supra* note 85, at 205.

162. *See* CSA, 21 U.S.C. § 812(b) (2012); *supra* Part II.B.1.

researchers, this criterion for reclassification is already met.¹⁶³ If marijuana were reclassified as a Schedule II or III substance, federal law would permit the issuance of prescriptions for medical marijuana,¹⁶⁴ and the restrictions that impede scientific research of marijuana would likely dissipate.¹⁶⁵

Critics of rescheduling contend that it will not solve the problems of the states that have legalized marijuana and will “not even [be] a significant step in the [right] direction.”¹⁶⁶ Although such critics are correct that “the mere act of placing herbal marijuana in Schedule II would not . . . address the conflict between state and federal law,”¹⁶⁷ rescheduling marijuana would be a step toward resolving that conflict by reducing restrictions on research and therefore increasing the amount of scientific data in the conversation on the regulation of marijuana.¹⁶⁸ While critics declare that “it is not necessary for marijuana to be rescheduled in order for legitimate research to proceed,” their arguments ignore the reality that marijuana research is effectively being prevented by the existing additional obstacles to research that critics minimize as “rather technical” and “not insurmountable.”¹⁶⁹

Finding a recognized medical use of marijuana to support reclassification has been difficult under the DEA’s current test for determining “currently accepted medical use.”¹⁷⁰ This is particularly true given the lack of scientific studies that are approved and supplied with research-grade marijuana,¹⁷¹ which has created a circular problem. However, though medical research on marijuana has been limited by its Schedule I classification, the research that has been done supports reclassifying marijuana due to its medical benefits for a variety of patients.¹⁷² One study

163. See *infra* text accompanying notes 172–76.

164. See 21 U.S.C. § 827(a)–(b).

165. See *supra* text accompanying notes 83–87 (explaining the additional restrictions on research of Schedule I substances, compared with Schedule II substances).

166. Sabet, *supra* note 87, at 82.

167. *Id.* at 91.

168. See *supra* text accompanying notes 83–87.

169. Sabet, *supra* note 87, at 97–98.

170. See Campbell, *supra* note 85, at 196–97. The DEA test has five factors: “(1) The drug’s chemistry must be known and reproducible; (2) there must be adequate safety studies; (3) there must be adequate and well-controlled studies proving efficacy; (4) the drug must be accepted by qualified experts; and (5) the scientific evidence must be widely available.” *Id.* (citing *All. for Cannabis Therapeutics v. DEA*, 15 F.3d 1131, 1135 (D.C. Cir. 1994)).

171. See *supra* Part IV.A.

172. See Igor Grant et al., *Medical Marijuana: Clearing Away the Smoke*, 6 OPEN

reported: “Based on evidence currently available the Schedule I classification [of marijuana] is not tenable; it is not accurate that cannabis has no medical value.”¹⁷³ Instead, research is revealing that “[cannabis’s] profile more closely resembles drugs in Schedule III” than those in Schedule I.¹⁷⁴ Considering these research results, physicians have endorsed further research of marijuana.¹⁷⁵ The recognition that marijuana has medicinal benefits and that it should be legally recognized as having an accepted medical use is gaining traction among judges, researchers, and physicians.¹⁷⁶

Unfortunately, critics maintain that there is not sufficient evidence of the required accepted medical use that would support reclassification under the CSA.¹⁷⁷ There is an ironic circularity to denying widespread marijuana research, while demanding that “only data from robust, controlled studies” will be sufficient to meet the criteria necessary to reschedule marijuana as a Schedule II substance that can be more readily researched.¹⁷⁸ Yet, despite critics’ demands, the existing scientific research shows medical benefits of marijuana and supports reclassification of marijuana as a Schedule II or III

NEUROLOGY J. 18, 24 (2012), <https://benthamopen.com/contents/pdf/TONEUJ/TONEUJ-6-18.pdf> (noting that for multiple sclerosis patients, marijuana is “effective in the treatment of peripheral neuropathy and muscle spasticity.”); Ruchlemer et al., *supra* note 133 (noting the benefits of cannabis for a cancer patient).

173. Grant et al., *supra* note 172.

174. *Id.*

175. See Stern & DiFonzo, *supra* note 80, at 708 (citing TIA TAYLOR, AM. COLL. OF PHYSICIANS, SUPPORTING RESEARCH INTO THE THERAPEUTIC ROLE OF MARIJUANA 6–8 (2008), https://www.acponline.org/system/files/documents/advocacy/current_policy_papers/assets/medmarijuana.pdf) The American College of Physicians unequivocally announced support for increased research of marijuana in 2008. *Id.*

176. See *United States v. Pickard*, 100 F. Supp. 3d 981, 999–1000 (E.D. Cal. 2015) (noting testimony from a board-certified medical doctor of 30 years, that “the majority of physicians . . . feel . . . cannabis has medical benefit” (alteration in original) and from a Columbia University associate psychiatry professor who operates a DEA-authorized laboratory that his personal observation of human subjects under the influence of marijuana led him and “the majority’ of qualified people [to] conclude[] marijuana has medical use,” specifically for HIV-positive patients that had been studied); Grant et al., *supra* note 172 (University of California researchers declared, “Based on evidence currently available . . . it is not accurate that cannabis has no medical value” and its “classification . . . as a Schedule I drug as well as the continuing controversy [over its] medical value are obstacles to medical progress . . .”); Stern & DiFonzo, *supra* note 80, at 708.

177. See, e.g., Sabet, *supra* note 87, at 94.

178. *Id.* at 93.

substance.¹⁷⁹

Reclassification as a Schedule II substance would place marijuana alongside drugs that are commonly used in medicine despite being evaluated as having a high potential for abuse, such as Vicodin and Adderall.¹⁸⁰ Additionally, drugs that many individuals believe are more damaging than marijuana, such as cocaine and methamphetamine, are classified only as Schedule II substances.¹⁸¹

Reclassification as a Schedule III drug would recognize the scientific studies that have found medical benefits to marijuana and would enable it to be prescribed in the same way as other Schedule III drugs, such as codeine or morphine.¹⁸² Furthermore, reclassification of marijuana as a Schedule II or III substance would allow for more widespread research on the use of pesticides on marijuana because some restrictions on research would be removed and the stigmatization of marijuana would likely continue to disappear.¹⁸³

Rescheduling marijuana to Schedule II or III of the CSA would lead to significant changes in the way lawmakers regulate marijuana. Currently, without science-based regulations for pesticide use on marijuana, there is a tremendous public health risk that individuals using marijuana, either medically or recreationally, are endangering themselves by consuming high amounts of pesticide residues.¹⁸⁴ This risk is even greater for medical marijuana patients, many of whom have compromised immune systems that make them more susceptible to unintended residues on marijuana.¹⁸⁵ Though rescheduling will not resolve all the disputes surrounding marijuana legalization, it would be a step toward making better-informed choices about marijuana in the future.

179. Grant et al., *supra* note 172 (declaring that marijuana's medical uses make it more like a Schedule III substance).

180. See CSA, 21 U.S.C. § 812(c) (2012); *Drug Scheduling*, U.S. DEA, <http://www.dea.gov/druginfo/ds.shtml> (last visited Nov. 11, 2016).

181. 21 U.S.C. § 812(c).

182. See *id.*

183. See *supra* text accompanying notes 83–87 (explaining restrictions on marijuana research); see also Lally, *supra* note 91, at 21–22.

184. Sullivan et al., *supra* note 16, at 5.

185. Ruchlemer et al., *supra* note 133.

VI. CONCLUSION

When federal agencies treat marijuana like a weed, rather than a crop, the public—not the marijuana industry—suffers. Some may wonder whether addressing safety concerns in an industry that is illegal under federal law makes sense when the federal government could simply enforce federal law on marijuana and eradicate marijuana. It does make sense.

Despite its treatment at the federal level, marijuana is a growing agricultural commodity in the United States. Marijuana products are legal under state law in 45 states and over 20 million people in the United States consumed marijuana in 2014.¹⁸⁶ These 45 states have not simply legalized marijuana for recreational use; the laws of these states recognize a medical value in compounds found in marijuana.¹⁸⁷ These states—90 percent of the United States—legally recognize what medical researchers are reporting: marijuana has medical value.¹⁸⁸ Yet, the DEA persists in denying rescheduling of marijuana on the basis of its lack of recognized medical value.¹⁸⁹ As long as marijuana remains classified as a Schedule I substance and the marijuana industry uses pesticides in the production of its crop, marijuana's current classification under the CSA will continue to create more health risks than it prevents.

Marijuana, like most agricultural crops, is grown using pesticides.¹⁹⁰ Unlike most agricultural crops, there is no federal regulation of the pesticides used on marijuana.¹⁹¹ For the exact reasons that the federal government created federal laws to protect consumers from these dangerous chemicals on other crops, marijuana consumers need to be protected from the health risks associated with unintentional consumption of pesticides.

In the vacuum of federal guidance, states with legalized marijuana industries, such as Colorado, have been left to develop their own regulations for pesticide use on marijuana. Unfortunately, these state regulations will be based, at best, on educated guesses and comparisons to other crops. Until marijuana is reclassified under the CSA and restraints on scientific research of marijuana are lifted, there will be insufficient information about the effects of pesticides on marijuana and marijuana consumers to create sound

186. *See supra* notes 1–2 and accompanying text.

187. *See supra* notes 2–5 and accompanying text.

188. *See supra* notes 171–75 and accompanying text.

189. *See supra* notes 48–49 and accompanying text.

190. *See supra* notes 11–16 and accompanying text.

191. *See supra* notes 12–13 and accompanying text.

public policy.

As more and more states contemplate legalizing marijuana, temporary fixes by the federal government—like FIFRA section 24(c) waivers—will become insufficient.¹⁹² The responsible reaction of the federal government would be to approve a reclassification of marijuana to a Schedule II or III substance, which better fit its characteristics given its recognized medical value.¹⁹³

While waiting on the federal government to take action, states can begin to improve the safety of their marijuana-consuming citizens by implementing their own regulations over the pesticides being used on commercially grown marijuana. Although this will be difficult given the lack of scientific guidance, Colorado's newly implemented marijuana-specific pesticide regulations provide a starting model for other states and will help guide the development of a responsible and safe marijuana industry.

*Jenna Hardisty Bishop**

192. *See supra* Part V.C.

193. Grant et al., *supra* note 172; *see supra* Part V.D.

* B.A., Creighton University, 2014; J.D. Candidate, Drake University Law School, 2017. The Author would like to thank the editorial board and staffers of the Drake Law Review for their phenomenal editing assistance; it has been a pleasure and an honor to work alongside each of you.