



Pushing for Organic Cannabis as Industry Grows

Pesticides being found to contaminate marijuana, as states struggle with public protections

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As medicinal and recreational marijuana continue to be legalized in numerous states, concerns about the safety of the burgeoning industry—how the substance is grown, harvested, processed, distributed, sold, and used—have emerged. Colorado’s recent experience is a case in point: In early December, the state’s Marijuana Enforcement Division (MED) announced two recalls on cannabis products out of concern about their contamination by pesticide residues.

In both cases, the recall announcements from the Colorado Department of Revenue, in conjunction with the Colorado Department of Agriculture (CDA) and the Colorado Department of Public Health and Environment, said that the state agencies “deem it a threat to public health and safety when pesticides that are not on the list of approved pesticides for marijuana use as determined by CDA are applied in a manner inconsistent with the pesticide’s label.” Three off-label pesticides were listed in the recall announcement. Pyriproxyfen was found in samples tested from Colorado Wellness Centers LLC (dba Lush), and bifenthrin and diuron were found in samples from Crossroads Wellness LLC (dba Boulder Botanics). None of those compounds is approved by Colorado for use on marijuana; two are listed as possible carcinogens by the U.S. Environmental Protection Agency (EPA).

At roughly the same time came news out of California of a decidedly human glitch in that state’s recreational cannabis rollout: when the state’s new, mandated, and rigorous cannabis testing protocols became operational on July 1 of 2018, a lab director—at Sequoia Analytical Labs of Sacramento—allegedly began to falsify analyses of hundreds of batches of cannabis that went out to retailers. The alleged fraud continued for some months, without the knowledge of anyone

else at the company, until—suspicious because of an unusual format of test reports that were submitted to it—the Bureau of Cannabis Control conducted an unannounced inspection of Sequoia’s laboratory. Reportedly, the lab director acknowledged that he’d falsified the reports, saying that some testing equipment was not functioning, and that he “just kept thinking [he] was going to figure it out the next day,” according to Sequoia’s general manager. The lab director was fired the day after the inspection, and the company voluntarily surrendered its cannabis testing license for 2018, although it hopes to regain it for 2019.

MECHANISM OF TOXICITY

Pesticide contamination of medical cannabis is important not only because it introduces toxic chemicals into a medicine, but also because medical cannabis can interfere with the detoxification of those pesticides via interference with cytochrome P450 enzyme system. Cytochrome P450 enzymes play an important role in the metabolism of chemicals, including pharmaceuticals and pesticides. This metabolism often helps to detoxify the chemicals (but it may, in some cases, make them more toxic). Among the pesticides detoxified by cytochrome P450 enzymes are pyrethroids, organophosphates, and carbamates. Cannabinoids have been shown to inhibit the activity of cytochrome P450 enzymes, which can make those pesticides more toxic.

CONTAMINATION CONCERNS GROWING

New Frontier Data CEO Giadha Aguirre de Carcer, pointing to California residue testing results, cites a threat to the medicinal cannabis market. She notes that 84% of 2016 product batches tested were found to harbor pesticide residue; and that in the recent California round of assays 20% failed established standards due to contamination from pesticides, bacteria, or processing chemicals, and in some cases, inaccurate labeling.

Ms. de Carcer, speaking to attendees at the Benzinga Cannabis Capital Conference in Toronto recently, said that cannabis producers must reduce the pesticide contamination in their products, at the very least because of consumer concerns that will translate to the marketplace. At that conference, she said, “Those are troublesome figures. . . . When we talk about people taking cannabis for medicinal use, we probably should do something about that.” Beyond the health implications of tainted marijuana products, consumer concerns about purity of those products will no doubt affect the success of the developing industry, which Ms. de Carcer predicts will be a \$20 billion market by 2025.

PESTICIDES ARE NOT REGISTERED FOR USE ON CANNABIS

Colorado’s recalls appear to represent a relatively cautious approach in response to the discovery of the three prohibited pesticide residues. However, there is a broader issue of public health concern, given that no pesticides registered by EPA have been evaluated for use in cannabis production. In fact, the concerns extend beyond the three pesticides at issue in Colorado. John Scott, of the CDA’s Pesticide Division, remarked, “No one’s done the risk assessments to determine that this specific parts per million on cannabis would still be safe. . . . That’s really the unknown and why we’ve taken the approach—a very precautionary approach.” He also noted that MED may issue more recalls if its enhanced mandatory pesticide testing for growers evidences the need. As increasing numbers of states were legalizing medical marijuana, Beyond Pesticides laid out the concerns—health and safety, and environmental—related to contamination of cannabis with pesticides, as well as a survey of what states were doing by way of regulation, in its report *Pesticide Use in Marijuana Production: Safety Issues and Sustainable Options*. (2015)

There are multiple (and confusing) layers to the legal cannabis landscape. For starters, the federal government continues to designate marijuana as a Class I illegal substance. Legal, legislative, and regulatory scrambling in the states—to catch up to a growing industry with which legislation and regulation have not kept abreast—arises in part from this federal conundrum.

Beyond Pesticides has maintained that pesticide use on cannabis is illegal. Because cannabis is not a legal agricultural crop under relevant federal law (FIFRA, the *Federal Insecticide, Fungicide, and Rodenticide Act*), EPA has not evaluated the safety of any pesticide on cannabis plants. EPA has established no allowances for pesticide use in cannabis production, and no tolerances, nor any exemptions from tolerances, for pesticide residues on cannabis.

As Beyond Pesticides wrote in 2015, “In the absence of federal regulations governing pesticides in cannabis production, the use of pesticides not registered by [EPA] is understood to

be illegal. Several states have codified this understanding by adopting policies that prohibit all federally registered pesticides. Other states have taken the position that state policy is unnecessary, since EPA has not registered any pesticides for cannabis production and registered pesticide use is illegal. A review of state laws conducted by Beyond Pesticides finds a patchwork of regulations with varying degrees of protection for consumers and the environment.”

Beyond Pesticides wrote to the Colorado Department of Agriculture in 2015 to detail its objection and highlight the nature of the problem with the agency’s March 2015 issuance of its memo, *Criteria for Pesticides Used in the Production of Marijuana in Colorado*—a document that set out the parameters of permitting for use of certain pesticides on cannabis crops. Subsequently, then-Governor John Hickenlooper issued an Executive Order “directing state agencies to address public safety concerns related to pesticide-contaminated cannabis. The next day, the state of Oregon adopted new rules strengthening its requirements for laboratory testing of cannabis for pesticides.”

Colorado, Washington, and Oregon have all taken steps to list “allowable” pesticides for marijuana cultivation. However, by law, states cannot label pesticides that do not have a federal pesticide registration, which cannot be accomplished because of cannabis’ illegal federal status. California began in June 2018 to set out parameters for testing of cannabis; at this juncture, all cannabis for medical and recreational use must be tested for 66 different proscribed pesticides, as well as for other contaminants, such as *E. coli*, feces, mold, insect and rodent parts, mycotoxins, terpenoids, and heavy metals. The regulatory matrix in the states is dynamic, and events such as Colorado’s recalls and California’s fraudulent lab reporting may spur further adjustments.

ESTABLISHING ORGANIC PRODUCTION STANDARDS

A genuinely precautionary approach would go well beyond catching prohibited pesticide (and other) contaminants in cannabis. Because of the absence of thorough federal testing of potential effects of the use of pesticides on cannabis for consumers, producers, and the environment, states should provide clear rules for sustainable production practices that will protect public health and the environment. The illegal federal status of cannabis and, therefore, the inability of EPA to register pesticides for use in cannabis production, offers a window to force the industry to embrace only those inputs exempt from federal registration and adopt true organic soil management practices. Beyond Pesticides recommends that states establish laws and/or regulations that mandate an organic systems approach to cannabis production. A requirement, for example, that growers and processors follow the dictates of national organic soil management standards would be prudent, precautionary, and a positive trajectory for the cannabis industry.