The Lake Erie Bill of Rights: Will it Survive Legal Challenges?

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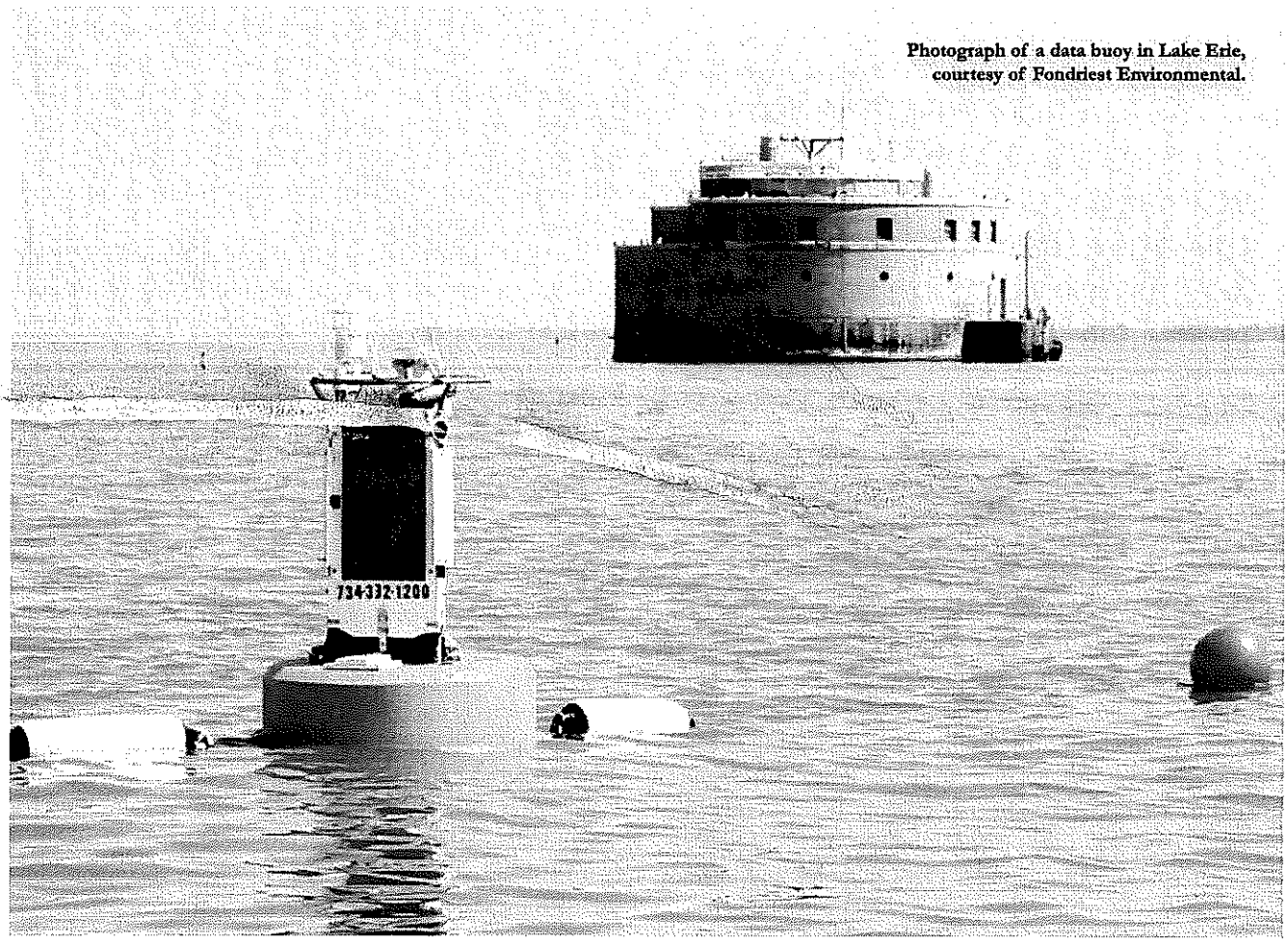


Photograph of a data buoy in Lake Erie, courtesy of Fondriest Environmental.

In recent years, Lake Erie has experienced multiple harmful algal blooms (HABs). The city of Toledo, Ohio relies on Lake Erie to supply drinking water to its residents. In 2014, a cyanobacterial HAB in Lake Erie forced Toledo to issue a "do not drink" order for tap water that resulted in 500,000 people being without drinking water for several days, and over 100 people in the city became ill from the water.[2] Toledo residents were forced to rely on bottled water, which sold out quickly and had to be brought in from neighboring areas.

Frustrated with the lack of federal and state regulation of industrial and agricultural runoff that has contributed to algal blooms, voters in Toledo recently passed a Lake Erie Bill of Rights (LEBOR). LEBOR seeks to hold business entities and governments liable for actions that threaten the ability of the lake's ecosystem "to exist, flourish and naturally evolve."[3] Farmers in the region have become increasingly concerned about how LEBOR could affect their fertilizing activities.[4] In fact, a lawsuit by an Ohio farm was filed the day after residents of Toledo approved LEBOR.

The Lake Erie Bill of Rights

LEBOR is an amendment to the city's charter and establishes the value of the lake to the city, the threats to the health of Lake Erie, and how the current law is not protecting Lake Erie. In addition to industrial wastes and climate change, LEBOR singles out "runoff of noxious substances from large scale agricultural practices, including hog and chicken farms" as threats to Lake Erie that "constitute an immediate emergency."[5] LEBOR extends the inalienable rights of the citizens of Toledo, as well as the political power bestowed upon the state's residents in Ohio's constitution, to Lake Erie and its ecosystem. By doing this, LEBOR aims to elevate "the rights of the community and its natural environment over powers claimed by certain corporations."[6]

LEBOR IS AN AMENDMENT TO THE CITY'S CHARTER AND ESTABLISHES THE VALUE OF THE LAKE TO THE CITY, THE THREATS TO THE HEALTH OF LAKE ERIE, AND HOW THE CURRENT LAW IS NOT PROTECTING LAKE ERIE.

LEBOR establishes certain rights possessed by the both Lake Erie and the residents of Toledo. The Lake Erie ecosystem possesses the "right to exist, flourish, and naturally evolve" while the city's residents "possess the right to a clean and healthy environment," which includes the right to a healthy lake ecosystem.[7] LEBOR next enumerates the prohibitions necessary to secure these rights. First, the charter amendment makes it unlawful for any government or corporation, which includes any business entity, to violate the bill of rights. LEBOR, therefore, does not apply to the actions of individuals. In addition, LEBOR invalidates any "permit, license, privilege, charter, or other authorization issued to a corporation, by any state or federal entity, that would violate the" rights or prohibitions of LEBOR.[8]

In terms of enforcement, LEBOR holds any business entity or government from any jurisdiction strictly liable for its violation. Violators of LEBOR's provisions can be subject to criminal convictions and fines, with each day and violation of each of LEBOR's sections constituting a separate violation. LEBOR enables the City of Toledo and its residents to enforce the rights and prohibitions listed in LEBOR. In these actions, the city or its residents can recover all litigation costs.[9]

However, LEBOR also bestows upon the Lake Erie ecosystem the ability to bring an action in its own name, essentially giving legal rights to the natural objects of the ecosystem. The city or its residents would bring these lawsuits, but the named plaintiff in the case would be the Lake Erie ecosystem. Thus, the city or its residents would simply be standing in for and protecting the ecosystem's rights and not their own. Under LEBOR's provisions, these lawsuits are entitled to damages to restore the ecosystem to its "status immediately before the commencement of the acts resulting in injury."[10] Any damages would be paid to the city to be used to restore the lake ecosystem.[11]

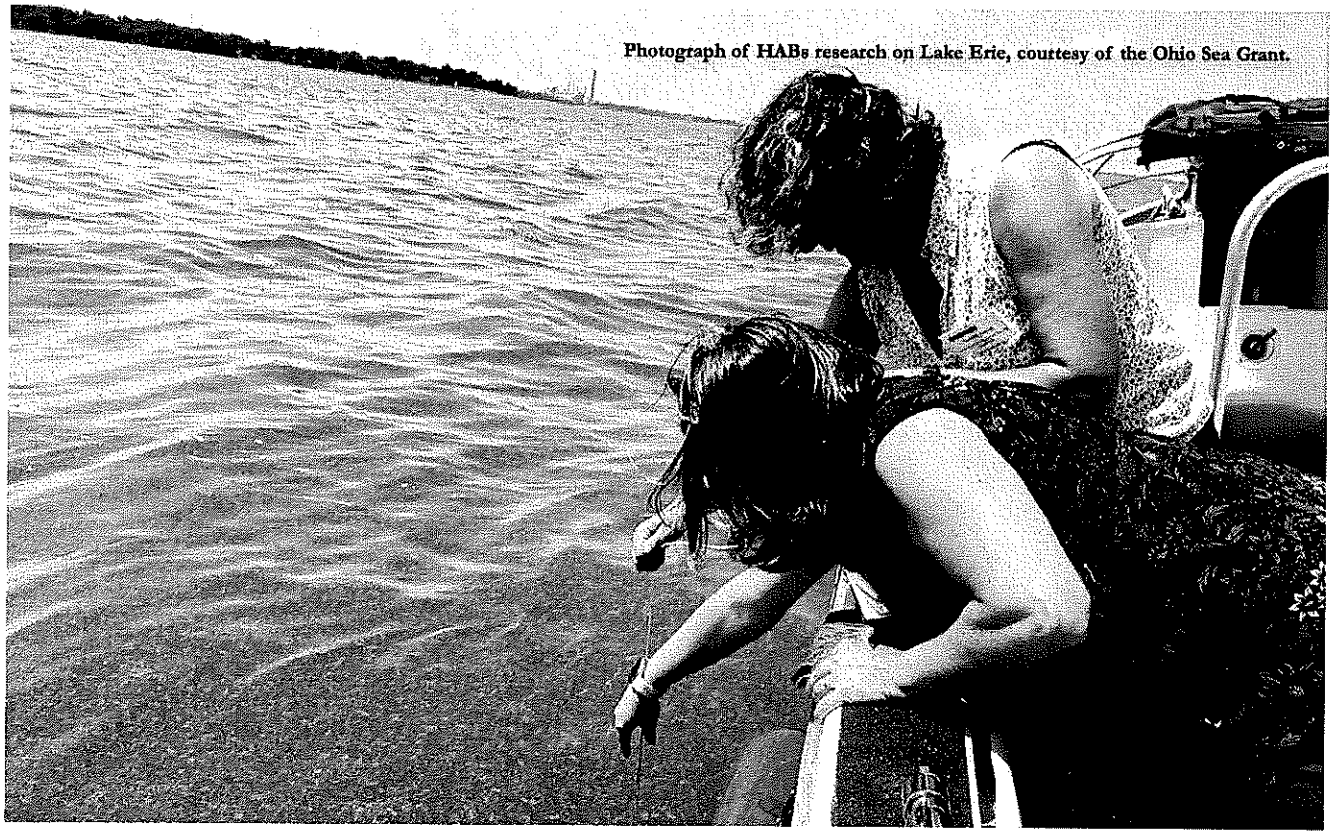
LEBOR Challenge

The day after its passage, LEBOR was challenged in federal court by Drewes Farms, which claims the charter amendment is unconstitutional and unlawful. Drewes Farms believes that LEBOR places the farm's financial future at risk, as the provisions expose the farm to massive liability if it uses fertilizer on its fields. While the farm has invested thousands of dollars in trying to reduce the amount of runoff coming from the farm, "it can never guarantee that all runoff will be prevented from entering the Lake Erie watershed."[12] Drewes Farms is seeking an immediate injunction of LEBOR, which would allow the farm to fertilize its fields in time for the upcoming growing season.

Drewes Farms' complaint includes numerous federal and state claims that focus on how LEBOR's terms could affect the farm's operations. In particular, the farm believes that LEBOR's holding only corporations and governments to strict liability is unconstitutional, because it does not apply to individual actors engaging in similar activities or inactions. The farm also takes issue with the phrasing of the rights statements in LEBOR, as it targets conduct that impacts the lake ecosystem's "right to exist, flourish, and naturally evolve." However, the farm points out that LEBOR fails to define what any of these terms mean or provide a standard to determine when these rights are violated.

Further, the farm believes that LEBOR's provisions invalidating state or federal permits, licenses, or other authorizations is unconstitutional by violating the substantive and due process clauses. In its complaint, Drewes Farms discusses how two employees of the farm have obtained Fertilizer Applicator Certificates by attending training by the Ohio Department of Agriculture. Thus, the farm argues that LEBOR unconstitutionally takes away their employees' rights to these certificates. While not in the complaint, these provisions could also potentially impact any permits a farm or other business entity has to discharge pollutants into waterways.

In addition, the complaint contains some state public trust doctrine related claims. Under Ohio law, Lake Erie's waters and lakebeds "belong and have always, since the organization of the state of Ohio, belonged to the state as proprietor in trust for the people of the state . . . ."[13] Ohio law designates the state Department of Natural Resources to handle "all matters pertaining to the care, protection, and enforcement of the state's rights" in the lake.[14] Thus, Drewes Farms argues that these provisions preempt the municipal regulation of Lake Erie, and Toledo does not have the authority to implement LEBOR.



Photograph of HABs research on Lake Erie, courtesy of the Ohio Sea Grant.

Conclusion

We will have to wait to see whether LEBOR will survive the Drewes Farms and any other future lawsuits. While the City of Toledo is trying to take action to protect the lake's resources, similar actions to LEBOR have not been successful in court. For instance, when Columbus, Ohio proposed a "Community Bills of Rights for Water, Soil, and Air Protection," the Ohio Supreme Court found the proposal to be beyond the legislative power of the city.[15] Further, while LEBOR gives the right to the Lake Erie ecosystem to file a lawsuit in its own name, courts have previously held that natural resources do not have the ability to bring lawsuits.[16] Only time will tell if courts will view LEBOR differently than these previous cases.

Endnotes

[1] Senior Research Counsel, National Sea Grant Law Center. This material is based upon work supported by the National Agricultural Library, Agricultural Research Service, U.S. Department of Agriculture under Subaward no. UA AES 05687-03 from the National Agricultural Law Center, University of Arkansas.

[2] *See* Greta Jochem, *Algae Toxins in Drinking Water Sickened People in 2 Outbreaks*, NPR, Nov. 9, 2017.

[3] *The Lake Erie Bill of Rights Initiative*, TOLEDOANS FOR SAFE WATER, [hereinafter LEBOR].

[4] For further a discussion of LEBOR's potential impact on agriculture, see Peggy Kirk Hall, Ellen Essman & Evin Bachelor, *The Lake Erie Bill of Rights Ballot Initiative*, IN THE WEEDS (Feb. 8, 2019).

[5] LEBOR, *supra* note 3, at Declarations Statement.

[6] *Id.*

[7] *Id.* § 1.

[8] *Id.* § 2.

[9] *Id.* § 3.

[10] *Id.* § 3(d).

[11] *Id.*

[12] Drewes Farm P'ship v. City of Toledo, No. 3:19-cv-00434-JZ (N.D. OH, filed Feb. 27, 2019).

[13] OHIO REV. CODE ANN. § 1506.10.

[14] *Id.*

[15] State ex. rel. Bolzenius v. Preisse, No. 2018-1221, 2018 WL 4517024 (Ohio Sept. 14, 2018); *see also* Hall, Essman & Bachelor, *supra* note 4.

[16] *See* Sierra Club v. Morton, 405 U.S. 727 (1972).

MISSISSIPPI RIVER VALLEY ALLUVIAL AQUIFER AND SPARTA AQUIFER COMPARISON REPORT FOR THE STATES OF MISSISSIPPI, ARKANSAS, LOUISIANA, TENNESSEE, AND MISSOURI

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OCTOBER 2018

NSGLC-18-06-05

AGRICULTURAL & FOOD
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USDA United States Department of Agriculture
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This material is based upon work supported by the National Agricultural Library, Agricultural Research Service, U.S. Department of Agriculture.

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I. Introduction

The Mississippi River Valley Alluvial Aquifer (MRVA) is located in multiple states, including Arkansas, Louisiana, Mississippi, Missouri, and Tennessee.[1] The bulk of the aquifer is in Arkansas, Mississippi, and Tennessee.[2] The MRVA is colloquially referred to as the Delta and is made up of thick blanket sands, which water naturally filters through.[3] The Sparta aquifer covers some of the same states as the MRVA. The Sparta aquifer extends from south Texas through Louisiana, Arkansas, Tennessee, Mississippi, and into Alabama.[4] The aquifer is made up "of varying amounts of unconsolidated sand, inter-stratified with silt and clay lenses within the Sparta Sand of the Claiborne Group."[5]

The primary uses of the water in the MRVA and Sparta aquifers vary by state. For example, in Arkansas the water is used mostly for public water supply and for supplementing crop irrigation.[6] Texas utilizes water from the Sparta aquifer for domestic and livestock purposes.[7] Louisiana primarily uses aquifer water for drinking water and industry purposes.[8] The MRVA is the primary crop irrigation source for the Mississippi Delta region. Each state has its own uses for the water, but they are all threatened by depletion of the aquifers.

The aquifers are most critical between Arkansas and Louisiana. A cone of depression has formed between El Dorado, Arkansas, and Monroe, Louisiana, but this isn't the only location where a cone of depression has formed.[9] A cone of depression forms by pumping wells too much so that it causes a depression, which alters the flow of the groundwater and leads to up-coning of brackish water from below.[10] This increases the chloride levels in the water and threatens the aquifer.

To an extent, states in the region have addressed threats to water resources through special management programs. For instance, the Arkansas Soil and Water Conservation Commission has designated certain counties as "critical groundwater areas," which encourages

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[1] *Aquifer Basics*, U.S. GEOLOGICAL SURVEY, https://water.usgs.gov/ogw/aquiferbasics/msrvaaq.html (last visited Sept. 28, 2018).
[2] U.S. DEP'T OF THE INTERIOR, MISSISSIPPI RIVER VALLEY ALLUVIAL AQUIFER, ALABAMA, ARKANSAS, ILLINOIS, KENTUCKY, LOUISIANA, MISSISSIPPI, TENNESSEE; 2006-2008, https://catalog.data.gov/dataset/mississippi-river-valley-alluvial-aquifer-alabama-arkansas-illinois-kentucky-louisian-2006-2008 (last visited Sept. 26, 2018).
[3] Claire Rose, *Determining Potential for Direct Recharge in the Mississippi River Valley Alluvial Aquifer Using Soil Core Analyses, Washington County, Northwestern Mississippi*, MISS. WATER RES. RESEARCH INST., http://www.wrri.msstate.edu/pdf/rose07.pdf; *Aquifer Basics*, U.S. GEOLOGICAL SURVEY, https://water.usgs.gov/ogw/aquiferbasics/uncon.html (both last visited Sept. 26, 2018).
[4] U.S. GEOLOGICAL SURVEY, THE SPARTA AQUIFER: A SUSTAINABLE WATER RESOURCE https://pubs.usgs.gov/fs/fs-111-02/ (last visited Sept. 26, 2018).
[5] *Id*.
[6] *Id*.
[7] *Sparta Aquifer*, TEX. WATER DEV. BD., http://www.twdb.texas.gov/groundwater/aquifer/minors/sparta.asp (last visited Sept. 26, 2018).
[8] *Aquifer Information*, LA. SPARTA GROUND WATER COMM'N, https://www.spartaaquifer.com/aquifer-info.php (last visited Sept. 26, 2018).
[9] U.S. GEOLOGICAL SURVEY, *supra* note 4.
[10] *Id*.

local authorities to address the problem and implement a plan to remedy the issue.[11] However, some states have taken different actions to address lower aquifer levels. Notably, the state of Mississippi has brought a lawsuit against the state of Tennessee for the use of the Sparta aquifer by the City of Memphis. Thus, much is still needed to be done and critical questions remain for states relying on the MRVA and Sparta aquifers.

This report will first provide an overview of the basics of water law, and will then examine the laws governing the allocation of surface water and groundwater in the following states- Mississippi, Arkansas, Louisiana, Tennessee, and Missouri. The report will then consider other aspects of water management in the region, including programs addressing water scarcity and water management districts.

II. Water Law Basics

Water Law provides the framework that guides our decisions about who gets to use freshwater. Water Law is generally state law - states get to determine their own rules on how to allocate the water within their borders. It is also a system that focuses on use, not conservation. What matters under the law is who is using water for what purpose, and some uses are more protected than others. For instance, domestic uses are more protected than industrial or agricultural uses.

Water Law is also an area of law that is split in a couple of fundamental ways, as surface water and groundwater are governed by two separate sets of legal principles. For groundwater, the rules vary by state under a handful of different legal doctrines. However, surface water has a stark regional difference, with the eastern and western United States following different doctrines. Finally, disputes over interstate water bodies are treated differently under the law.

a. Surface Water

The West has always had water supply issues, and a legal doctrine known as prior appropriation developed to deal with this scarcity. In the prior appropriation system, the state issues water rights to users on a time-based priority basis as certain amounts of each waterway are doled out to individual users. Thus, a water user's ability to draw water depends on how early or late your water right is in the priority system. Thus, if the stream dries up before it is a junior water rights holder's turn in the priority system, he or she is out of luck. Thus, water rights in the prior appropriation system is completely contingent on whether there is any water left in the stream to use.

In comparison, the East has traditionally been viewed as water rich, and the law recognizes this. Those who live on waterways are considered riparians, and they can use the water abutting their property however they like so long as the use is reasonable and doesn't affect other riparians. This means until there is a problem, there is very little monitoring or control over how much water a riparian owner is using. In addition, some states have adopted permit systems that requires some water withdrawals to be permitted. These systems vary by

[11] *Sparta Aquifer Recovery Study*, UNION COUNTY WATER CONSERVATION BD., https://argis.ualr.edu/website/unionCoGraph/spartaHistory.asp (last visited Sept. 26, 2018).

state, but are generally referred to as regulated riparianism. Further, as the eastern United States starts to face water scarcity issues, problems with the riparian system are emerging.

b. Groundwater

Groundwater has its own set of rules that are distinct from the rules governing surface water use. But there are a couple specific issues with groundwater that have affected how these rules have developed. With surface water, sources run out when we overuse- the stream or river simply goes dry. With groundwater, this usually isn't the case. In many aquifers, there is or was a lot of water to use for long periods of time. In addition, historically there was a lack of understanding of the science of aquifers. Since groundwater often could not be seen from above ground, there was an assumption that there would always be enough water to use. Both of these facts helped create the illusion that groundwater resources were limitless.

Because of this, groundwater doctrines often allowed water users to use vast amounts of groundwater, with no regard for the repercussions. However, over pumping groundwater can have serious consequences. Over pumping groundwater can cause subsidence, negatively affect ecosystems and habitats, and in coastal areas, can cause saltwater to intrude aquifers, which pollutes drinking water and harms crop lands. Further, when the water table is lowered, landowners are forced to drill deeper wells to access water. In addition, due to over pumping, most aquifers are being "mined." Mining is a term of art that means more water is being pumped out of the source than is being recharged. Aquifers are susceptible to mining because aquifer recharge happens at very low rates - often inches per year, while pumping often depletes aquifers at feet per year.

There are varying common law groundwater doctrines that states developed to regulate the use of groundwater. In addition, groundwater rules are not simply based on use rights. Since groundwater pumping can have negative effects on your neighbors, the common law rules often also include rules of liability. The groundwater doctrines include the rule of capture, American reasonable use, correlative rights, and prior appropriation.

The rule of capture is the oldest doctrine. The capture rule allows a landowner to pump groundwater from his or her property. The rule also insulates a landowner who withdraws groundwater from beneath the surface of his land from any liability to neighboring landowners for the injuries that those withdrawals cause.[12] The modern understanding of the connection between surface water and groundwater has decreased the capture rule's popularity, but it is still used in several jurisdictions, including Texas and Maine. This rule can be modified, however, in certain areas that have critical groundwater levels. For instance, the rule of capture does not apply to withdrawals from the Edwards Aquifer in Texas. In addition, if a landowner is willfully or negligently pumping in a way that harms a neighbor, such as by causing subsidence, the landowner can be liable.[13]

[12] *See* Sipriano v. Great Spring Waters of America, Inc., 42 Tex. Sup. Ct. J. 629, 1 S.W.3d 75 (1999).
[13] *See* City of Corpus Christi v. City of Pleasanton, 276 S.W.2d 798, 801 (Tex. 1955); Friendswood Dev. Co. v. Smith–Southwest Indus., Inc., 576 S.W.2d 21, 30 (Tex. 1978).

The American Reasonable Use doctrine is a modification of the rule of capture. The doctrine began to replace the rule of capture in states beginning in the early 20th century. Most simply, the American Reasonable Use doctrine is essentially the same as the rule of capture, but the doctrine requires that the groundwater be used on the overlying tract of land for a reasonable use.[14]

Under a correlative rights approach, no person has a proprietary interest in ground water, only a usufructuary interest. Thus, being a landowner does not necessarily give you a right to pump up water beneath your land. Because of this, the rule requires that water be shared based on both the water's use and the rights of the landowners in the area.[15]

Finally, the prior appropriation doctrine for groundwater is very similar to the surface water doctrine. As with surface water, the senior users who first pumped the groundwater for a beneficial use gain priority over junior users and have superior rights to use the water.[16] The doctrine does not function as well for groundwater, however. Unlike with surface water, when a groundwater well goes dry, there is usually still water left in the aquifer, meaning that the water could be accessed if the water user simply drills a deeper well.

c. Interstate Disputes

While Water Law is mostly a matter of state law, when two or more states disagree on how to share water resources between them, federal rules apply. Interstate water disputes are common, and sometimes states can negotiate agreements as to how to share water resources that cross state borders. But when states can't reach an agreement among themselves, the disputes can only be resolved by the Supreme Court of the United States (SCOTUS), as the Court has original jurisdiction in all cases in which a state is a party. In suits between states, SCOTUS serves as a trial court and appoints a special master to run a trial-like process. The special master hears the parties' initial motions and evaluates the evidence. The special master then makes findings of fact, conclusions of law, and recommends a decision for the Court. SCOTUS then decides whether or not to follow the special master's recommendation.

Currently, Mississippi and Tennessee are in a dispute concerning groundwater from the Memphis Sands Aquifer, which is fed mostly by the Sparta Sands Aquifer and underlies several states including Mississippi and Tennessee. Mississippi and Tennessee both pump water from this aquifer. The City of Memphis pumps its water very close to the Mississippi-Tennessee border. Mississippi has challenged this use before by suing the City of Memphis for monetary damages. In 2009, the 5th Circuit Court of Appeals dismissed Mississippi's lawsuit ruling that Mississippi had framed its case incorrectly.[17] The court determined that the aquifer was an interstate resource, so Tennessee, which was not named in the suit, was a necessary party.[18]

[14] *See* Meeker v. City of East Orange, 77 N.J.L. 623, 74 A. 379 (N.J. 1909).
[15] *See* Woodsum v. Pemberton Township, 172 N.J.Super. 489, 412 A.2d 1064 (N.J. App. 1980).
[16] *See* Farmers Inv. Co. v. Bettwy, 558 P.2d 14 (Ariz. 1976).
[17] Hood, ex rel. Mississippi v. City of Memphis, 570 F.3d 625 (5th Cir. 2009), *cert. denied*, Mississippi v. City of Memphis, 559 U.S. 904 (2010).
[18] *Id.*

Further, since it was an interstate dispute, original and exclusive jurisdiction belonged to SCOTUS.[19]

The Supreme Court agreed to hear Mississippi's case against Tennessee, along with the City of Memphis and the Memphis Light, Gas, and Water Division, regarding the use of the aquifer. The states of Mississippi and Tennessee have very different theories for the case. Tennessee, referring to the previous 5th Circuit decision, is claiming the water is an interstate resource, and thus, the Court needs to determine how much each state is entitled to.[20] However, Mississippi is claiming that Tennessee is actually pumping water from under Mississippi and that this water would never leave Mississippi but for Tennessee's pumping. Like its previous lawsuit, Mississippi is treating the water in the aquifer as Mississippi property, not as an interstate resource, and is asking for damages for the water Tennessee has taken.[21] In early 2019, the Special Master will hold an initial hearing in the case to determine whether the aquifer is or is not an interstate resource.

III. State by State Analysis of Water Laws

Prompted by the *Mississippi v. Tennessee* lawsuit, the National Sea Grant Law Center (NSGLC) has undertaken a review of the water laws for several states that draw from the MRVA and Sparta Aquifers. This section summarizes the findings of that review.

a. Mississippi

In Mississippi, the law governing the use of water appears to be the same for both surface and groundwater. Mississippi works under a permit system that is similar to a modified version of the prior appropriation method that most Western States utilize.[22] In order to use surface or groundwater you must first obtain a permit from the Mississippi Department of Environmental Quality's (MDEQ). Mississippi Code Annotated §51-3-5(1) states:

> No person who is not specifically exempted by this chapter shall use water without having first obtained a permit as provided herein and without having otherwise complied with the provisions of this chapter, the regulations promulgated hereunder and any applicable permit conditions.

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[19] *Id.*

[20] Answer of Defendant State of Tennessee, Mississippi v. Tennessee, et al., No. 143, Orig. (U.S. filed Sept. 14, 2015) (Dkt. No. 15), http://www.ca6.uscourts.gov/sites/ca6/files/documents/special_master/DE%204%20Tennessee%20Brief%20in%20Opposition.pdf (last visited Sept. 26, 2018).

[21] State of Mississippi's Brief in Support of Motion for Leave To File Bill of Complaint in Original Action, Mississippi v. Tennessee, et al., No. 143, Orig. (U.S. filed June 6, 2014) (Dkt. No. 1), http://www.ca6.uscourts.gov/sites/ca6/files/documents/special_master/DE%201%20Mississippi%20Motion%20for%20Leave%20to%20File%20Complaint.pdf (last visited Sept. 26, 2018).

[22] DON R. CHRISTY ET AL, A COMPARISON OF SURFACE WATER LAWS AND REGULATIONS FROM SOUTHEASTERN STATES (2005), https://athenaeum.libs.uga.edu/bitstream/handle/10724/19397/surfacewater.pdf?sequence=1 (last visited Sept. 26, 2018).

There are exemptions to this requirement in Mississippi Code Annotated §51-3-7, which specifies that anyone using water purely for domestic purposes does not need to obtain a permit. Also, if a user will pump water from a well that is less than six inches in diameter, no permit is required.

The MDEQ and its Office of Land and Water Resources (OLWR) list the beneficial uses for groundwater based on which has the highest priority of beneficial use. The top two uses for groundwater are public water supply and industrial/commercial uses.[23] Industrial and commercial uses are delineated into more specific categories that include agriculture, industrial, livestock, and commercial.[24] The OLWR also lists several limitations on uses of water for both surface and groundwater. The limitations for surface water are based on the established minimum flow for a given watercourse. The Permit Board may limit municipal users and industrial users based on criteria that would affect the established minimum flow. The limitations for groundwater are situation specific. For example, using a large volume of water for a once-through, non-contact cooling purpose is not considered a beneficial use, so using an amount of water in excess of 20,000 gallons per day is prohibited. While surface water and groundwater are generally treated the same, the OLWR under its Rule 1.4 spells out the regulations for groundwater withdrawals.[25]

Drilling wells or boreholes to access groundwater requires a license with the Mississippi Commission on Environmental Quality.[26] The license required to drill a well or borehole is a contractor's license, and there are specific requirements that must be met in order to obtain a license to drill for groundwater.[27] Additionally, there are specific requirements for the MRVA Aquifer that are different from other groundwater in Mississippi. Due to the unique make-up of the MRVA, the MDEQ has distinct construction and disinfection standards for the MRVA. In addition to these standards the Delta Sustainable Water Resources Task Force states that the MRVA is used for irrigation, aquaculture, and wildlife management purposes.[28]

b. Arkansas

The laws for allocation of water in Arkansas are similar for both surface and groundwater. Arkansas operates under a regulated riparianism system. A core concept of Arkansas' water laws is reasonable use. The reasonable use concept was introduced in Arkansas by *Harris v. Brooks* in 1955.[29] This case set out some basic principles for Riparianism and the reasonable use concept. The court stated, "The right to use water for strictly domestic

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[23] *Administrative Procedures Act Rules, Chapter 1*, MISS. DEP'T OF ENVTL. QUALITY, https://www.mdeq.ms.gov/wp-content/uploads/2017/06/11-Miss.-Admin.-Code-Pt.-7,-Ch.-1..pdf (last visited Sept. 27, 2018).
[24] *Id*.
[25] *Id.*
[26] *Administrative Procedures Act Rules, Chapter 2*, MISS. DEP'T OF ENVTL. QUALITY https://www.mdeq.ms.gov/wp-content/uploads/2017/06/11-Miss.-Admin.-Code-Pt.-7-Ch.-2..pdf (last visited Sept. 27, 2018).
[27] MISS. CODE. ANN. § 51-5-1.
[28] *Delta Sustainability Water Resources Task Force*, MISS. DEP'T OF ENVTL. QUALITY, https://www.mdeq.ms.gov/water/water-availability-and-use/delta-sustainable-water-resources-task-force/ (last visited Sept. 27, 2018).
[29] Harris v. Brooks, 225 Ark. 436, (1955).

purposes…is superior to many other uses of water. Other than domestic use, all other lawful uses of water are equal." The reasonable use concept applies to both surface and groundwater in Arkansas. The primary use of surface water is for public water supply.[30] The primary use of groundwater is for irrigation, with nearly 6.9 billion gallons used per day.[31] The Arkansas Supreme Court has applied the correlative rights doctrine to groundwater within the state.[32]

The Arkansas Natural Resource Commission (ANRC) requires annual reports of water usage. "Water users must annually report source of the water, point of diversion, purpose of the use of the water, quantity diverted, location of use, and times of the year when diversion is proposed."[33] Persons in Arkansas "diverting less than 325,900 gallons of water in any water year," or persons diverting surface water exclusively owned by one person are exempt from registration with the ANRC.[34] Additionally, there are certain wells that are exempt from registration. The ANRC states that household wells used exclusively for domestic use, as well as wells with potential flow rates less than 50,000 gallons a day are also exempt from reporting requirements.[35]

c. Louisiana

The Louisiana *liassez faire* attitude applies to its water laws as well. Since Louisiana is generally a water-rich state, there are few regulations on water allocation.[36] While Louisiana's can be broadly categorized as a riparian state, the state's civil code differentiates it from other southeastern riparian common law states. Louisiana Civil Code Articles 657 and 658 provide the foundation and reasoning for riparianism in the state.[37] Apart from these Articles, there is little to no concrete water law for the state. Article 657 reads "[t]he Owner of an estate bordering on running water may use it as it runs for the purpose of watering his estate or for other purposes."[38] The Article provides a clear reference to riparianism due to the reference to a property owner using water running through his property. Article 658 states "[t]he owner of an estate through which water runs, whether it originates there or passes from land above, may make use of it while it runs over his lands. He cannot stop it or give it another direction and is bound to return it to its ordinary channel where it leaves his estate."[39] This Article indicates that if the water is not

[30] U.S. GEOLOGICAL SURVEY, ESTIMATED WATER USE IN ARKANSAS, 2010 (2015) https://pubs.er.usgs.gov/publication/sir20155062 (last visited Sept. 27, 2018).
[31] *Ground Water Use*, ARK. GEOLOGICAL SURVEY, http://www.geology.ar.gov/water/groundwater_use.htm (last visited Sept. 27, 2018).
[32] ARK. NATURAL RES. COMM'N, WATER LAW IN ARKANSAS (2011), https://static.ark.org/eeuploads/anrc/arkansas_water_law_2011_draft-new.pdf (last visited Sept. 27, 2018).
[33] ARK. CODE ANN. § 15-22-215.
[34] ARK. ADMIN. CODE § 138.00.2-302.2.
[35] *Id*. at § 138.00.6-402.2.
[36] For an in-depth analysis of water rights in Louisiana, see LA. STATE LAW INST., REPORT IN RESPONSE TO SCR 53 OF THE 2012 REGULAR SESSION- THE USE OF SURFACE WATER VERSUS GROUNDWATER (2014), http://www.law.tulane.edu/uploadedFiles/Institutes_and_Centers/Water_Resources_Law_and_Policy/Content/4.04.14,%20Roberson,%20Water%20Law%20Report.pdf (last visited Sept. 28, 2018).
[37] MARK DAVIS, TULANE INST. ON WATER RES. LAW AND POLICY, A TOE IN THE WATER: A PRIMER ON LOUISIANA RIPARIAN LAW AND EMERGING ISSUES PREPARED FOR THE LOUISIANA MINERAL LAW INSTITUTE (2009), http://www.law.tulane.edu/uploadedFiles/Institutes_and_Centers/Water_Resources_Law_and_Policy/Content/A%20Toe%20in%20the%20Water,%20Davis%20,%20Mineral%20Law%20Inst.pdf (last visited Sept. 27, 2018).
[38] LA. CIV. CODE ANN. art. 657
[39] *Id.* at art. 658

running, no riparian rights apply. Further, stating that the water can be used as it runs over the riparian's land and that the water must return to its ordinary channel indicates that the water is meant to remain in the same water basin and introduces the reasonable use doctrine.

Louisiana Revised Statutes Section 9:1104 permits a riparian to assign his or her riparian rights in running surface water to a non-riparian for "agricultural or aquacultural purpose." The section states that neither agriculture or aquaculture are consumptive uses of water. In fact, these uses could actually enhance the hydrological cycle, such as by recharging aquifers with percolating water used for these purposes. The statute defines "agricultural or aquacultural purpose" as "any use by a riparian owner or an assignee of a riparian owner of running surface waters withdrawn and used for the purpose of directly sustaining life or providing habitat to sustain life of living organisms that are customarily or actually intended to be brought to market for sale."[40]

There are a couple restrictions on the assignment of riparian rights to a non-riparian under this section. First, the water must stay within the state of Louisiana. Further, the withdrawal must be "environmentally and ecologically sound" and "consistent with the required balancing of environmental and ecological impacts with the economic and social benefits" in the Louisiana Constitution.[41] The section also contains several other restrictions, including that the withdrawal cannot have an undue impact on navigation or public drinking water supplies.

There are currently no Civil Code provisions addressing groundwater, and courts in the state have not extended article 657 and 658 to groundwater.[42] However, the Mineral Code in Louisiana states that its provisions are applicable to the removal of "subterranean water," but this is the only reference to water in the act's provisions.[43] Article 9 of the mineral code discusses correlative rights, stating that "[l]andowners and others with rights in a common reservoir or deposit of minerals have correlative rights and duties with respect to one another in the development and production of the common source of minerals."[44] However, the applicability of this provision to subterranean water has not been addressed by the courts.[45]

The Sparta Aquifer is primarily utilized in northern Louisiana, specifically north-central Louisiana.[46] The two largest uses for the Sparta Aquifer are for public supply and for industrial use. Approximately 31.5 million gallons of Sparta Aquifer water is used each day for industrial purposes. The MRVA Aquifer is used statewide as a groundwater source. In northwestern Louisiana, it often represents the only source of water. The primary use of the MRVA is for irrigation with nearly 122 million gallons used per day within the state.

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[40] LA. REV. STATUTES § 9:1104(C).
[41] *Id.* at § 9:1104(B).
[42] LA. STATE LAW INST., *supra* note 36, at 36-37.
[43] LA. REV. STATUTES § 31:4.
[44] *Id.* at § 31:9.
[45] LA. STATE LAW INST., *supra* note 36, at 43.
[46] C.G. STUART ET AL., U.S. GEOLOGICAL SURVEY, GUIDE TO LOUISIANA'S GROUND-WATER RESOURCES (1994), https://pubs.usgs.gov/wri/1994/4085/report.pdf (last visited Sept. 27, 2018).

d. Tennessee

Through its statutes, the state of Tennessee has declared that "the waters of the state are the property of the state and are held in public trust for the benefit of its citizens" and "the people of the state are beneficiaries of this trust and have a right to both an adequate quantity and quality of drinking water."[47] Tennessee water laws can be generally categorized, like many other states in the southeast, as a system of regulated riparianism. Tennessee operates under a riparian permit system through the Tennessee Water Resources Information Act, the Inter-Basin Transfer Act, and the Water Quality Control Act. Tennessee is a riparian rights state and the doctrine of reasonable use applies to both surface and groundwater. Tennessee groundwater is more specifically governed by the correlative rights doctrine, like Arkansas.[48]

The general assembly of Tennessee recognized that abusing water resources can have consequences. Thus, the Tennessee Water Resources Information Act ("Information Act") was created to "institute a system of registration so that adequate information is obtained to document current demand for water and to project growth in that demand..."[49] The Information Act regulates withdrawals of surface and groundwater.[50] The Information Act requires that persons withdrawing 10,000 gallons or more of surface or groundwater per day must register with the commissioner of the Tennessee Department of Environment and Conservation (TDEC).[51] The Information Act specifies certain exceptions to this requirement. For example, a person may withdraw water for agricultural purposes without first obtaining a permit and registering the withdrawal, regardless of the amount of water being withdrawn.

The Inter-Basin Transfer Act (IBT Act) also regulates water use in Tennessee. The IBT Act requires permits, issued by the Commissioner of the TDEC, for most water transfers between basins. The "basins" that are regulated by the IBT Act are the major rivers in Tennessee and their tributaries, including the Mississippi River. Tennessee Code Annotated § 69-7-204 specifies that the IBT Act requires "persons or entities that have been granted powers by the state to acquire water, water rights and associated property by eminent domain or condemnation or that acquire or supply water for the use or benefit of public water supply…" who intend to increase their use or plan on introducing a new use must obtain a permit. This Act applies primarily to surface water, but can also apply to groundwater. The IBT Act states that if a groundwater withdrawal

[47] TENN. CODE ANN. § 68-221-702. The state has made a similar statement in its Water Quality Control Act: "Recognizing that the waters of Tennessee are the property of the state and are held in public trust for the use of the people of the state, it is declared to be the public policy of Tennessee that the people of Tennessee, as beneficiaries of this trust, have a right to unpolluted waters. In the exercise of its public trust over the waters of the state, the government of Tennessee has an obligation to take all prudent steps to secure, protect, and preserve this right." *Id.* at § 69-3-102(a). This section also creates a planning obligation on behalf of the state: "Recognizing that the waters of the state are the property of the state and are held in public trust for the benefit of its citizens, it is declared that the people of the state are beneficiaries of this trust and have a right to both an adequate quantity and quality of drinking water." *Id.* at § 69-3-102(b).

[48] 4-TN WATERS AND WATER RIGHTS I (2018); *see also* Nashville, Chattanooga & St. Louis Railway v. Rickert, 89 S.W.2d 889, 896-98 (Tenn. Ct. App. 1935).

[49] TENN. CODE ANN. § 69-7-302.

[50] *Id.* at § 69-7-301 - § 69-7-309.

[51] *Id.* at § 69-7-303 and 304.

"has a significant potential to adversely affect the flow of a Tennessee surface water," then the person or entity withdrawing the water must first obtain a permit to do so.[52]

Certain water diversions in the state of Tennessee may also require an Aquatic Resource Alteration Permit (ARAP), which is part of the water pollution control chapter of the Tennessee Code.[53] Section 69-3-108 enumerates on the specific situations that would require an ARAP, which include "the alteration of the physical, chemical, radiological, biological, or bacteriological properties of any waters of the state."[54] Thus, groundwater withdrawals that alter surface waters may require an ARAP. Tennessee previously had regulations regarding ARAPs, but those rules have since been repealed.[55]

The majority of water used in Tennessee is surface water and a small percentage of groundwater.[56] The primary uses for water in the state are (in order of highest use) thermoelectric, industrial, public supply, and irrigation. However, the highest demand is from public supply. The Tennessee Valley Authority states that even though thermoelectric is the largest use category, it is also the largest source of return flow. The majority of groundwater is used for public water supply with an estimated 22.8% of public supply use coming from groundwater in 2010.[57] The uses of groundwater in West Tennessee, where the MRVA and Sparta aquifers are located, include public water supply, industrial, and agriculture. In particular, Memphis, TN is one of a number of cities that primarily relies on groundwater for its drinking water supplies.[58]

e. Missouri

Missouri is a riparian state with few water laws because Missouri is a uniformly water rich state. In fact, the Missouri Department of Natural Resources states "There are no state laws, regulations or policies that specify the quantity of water that any diverter may use."[59] Most of Missouri's laws regarding water allocation and use come from case law. The Missouri Department of Natural Resources says that there are no groundwater allocation rules in the state. *Higday v. Nickolaus* addressed groundwater allocation and use in its 1971 decision.[60] The court

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[52] *Id.* at §69-7-204.
[53] *Id.* at §69-3-108; Aquatic Resource Alteration Permit (ARAP), Tenn. Dep't of Env't and Conservation, https://www.tn.gov/environment/permit-permits/water-permits1/aquatic-resource-alteration-permit--arap-.html (last visited Sept. 27, 2018).
[54] *Id.* at §69-3-108(b)(1).
[55] *See Rules of the Tennessee Department of Environment and Conservation*, TENN. DEP'T OF ENV'T AND CONSERVATION, https://publications.tnsosfiles.com/rules/0400/0400-40/0400-40.htm (last visited Sept. 27, 2018).
[56] CHARLES E. BOHAC & AMANDA K. BOWEN, TENN. VALLEY AUTH., WATER USE IN THE TENNESSEE VALLEY FOR 2010 AND PROJECTED USE IN 2035 (2012), http://152.87.4.98/river/watersupply/water_use.pdf (last visited Sept. 27, 2018).
[57] Id.
[58] *See* Tom Charlier, *The Memphis Sand Aquifer: A Buried Treasure*, COMMERCIAL APPEAL, Dec. 16, 2016, https://www.commercialappeal.com/story/news/environment/2016/12/16/memphis-sand-aquifer-buried-treasure/93814278/.
[59] *Frequently Asked Missouri Water Resources*, MO. DEP'T OF NATURAL RES., https://dnr.mo.gov/pubs/pub1350.htm (last visited Sept. 27, 2018).
[60] MO. DEP'T OF NATURAL RES., A SUMMARY OF MISSOURI WATER LAWS 237 (2000) https://dnr.mo.gov/pubs/WR51.pdf at 237.

in *Higday* applied the reasonable use doctrine to groundwater and found that a riparian cannot own percolating groundwater or prevent other riparians from using groundwater.[61] The riparian and reasonable use doctrines are applied strongly in Missouri to both surface and groundwater.

However, anyone using more than 70 gallons per minute or 100,000 gallons per day must register their water use with the Division of Geology and Land Survey of the Department of Natural Resources.[62] These diverters are known as "major water users," and the registration applies to withdrawals or diversions from "from any stream, river, lake, well, spring or other water source."[63] In addition, the state's Department of Natural Resources Water Resources Center "operates and maintains a groundwater level observation well network for monitoring Missouri's aquifers" that "provides knowledge of available water quantity, aquifer response to water use, groundwater recharge and aquifer characteristics."[64]

The largest consumptive uses of water in the state are thermal electric generation, municipal, industrial, and agricultural.[65] Since the MRVA is very localized to be a small area in Missouri, overall it is not considered to be a major water source. However, the aquifer is a significant resource in locations where the aquifer's water is available.[66] The MRVA is used primarily for agriculture and public water supply in the state.[67]

IV. Management Programs Addressing Scarcity

Throughout the country, water resources are showing the stress of overuse. Perhaps this can best be shown by the current number of interstate disputes before the Supreme Court of the United States. For instance, in addition to the Mississippi v. Tennessee case, Florida is suing Georgia, claiming that the use of water in the Atlanta metro-area is affecting the amount of water flowing into the state of Florida, negatively affecting the state's natural resources.[68] Thus, states are becoming increasingly active in adopting management programs to address water supply issues within their borders.

For instance, the Sustainable Groundwater Management Act (SGMA) was signed into California law in 2014 with the goal of providing a framework for groundwater management in the state. The Act requires high and medium priority basins to cease over drafting groundwater

[61] Higday v. Nickolaus, 469 S.W.2d 859 (Mo. Ct. App. 1971).
[62] MO. ANN. STAT. § 256.410.
[63] *Id.* at § 256.400.
[64] *Water Resources Center*, MO. DEP'T OF NATURAL RES., https://dnr.mo.gov/geology/wrc/ (last visited Sept. 28, 2018).
[65] MO. DEP'T OF NATURAL RES., *supra* note 59, at 131.
[66] *Mississippi and Missouri River Alluvial Aquifer*, MO. DEP'T OF NATURAL RES., https://dnr.mo.gov/geology/wrc/groundwater/education/provinces/riveralluviumprovince.htm (last visited Sept. 27, 2018).
[67] *Missouri Groundwater Provinces and Aquifer Characteristics*, Univ. of Mo. Extension, http://agebb.missouri.edu/drought/water/MissouriGroundwaterProvincesandAquiferCharacteristics.pdf (last visited Sept. 27, 2018).
[68] Florida v. Georgia, 138 S. Ct. 2502 (2018).

basins and bring these basins to sustainable levels within 20 years or by a set date.[69] This is the first regulation in California aimed at conserving and sustaining groundwater sources.

The Edwards Aquifer in Texas "is one of the most abundant artesian aquifers in the world," supplying "water to over two million people and thousands of farmers" in the San Antonio region of Texas.[70] However, this reliance by the people of South Central Texas has also led to the aquifer's overuse, prompting the creation of the Edwards Aquifer Authority to better manage the aquifer's resources and protect endangered and threatened species in the area. As discussed above, the rule of capture does not apply to withdrawals from the Edwards Aquifer in Texas. Rather, water users must first obtain a permit from the Edwards Aquifer Authority.[71]

A couple of the states in the South have also created groundwater management programs. Legislation enacted in 1957 created a dam permit system through the Arkansas Soil and Water Conservation Commission (ASWCC) and gave the Commission the authority to allocate water during periods of shortage.[72] Even though the ASWCC has the authority to allocate water, as of 2011 no situation or request had occurred in which they allocated water.[73] In the event that water needs to be allocated, the Commission would allocate "subject to the following order of preference: (1) sustaining life, (2) maintaining health, and (3) increasing wealth.[74] Water required for domestic use, federal water rights, and for minimum streamflow is supposed to be reserved when water is to be allocated.[75] After those three reserved uses, riparian uses for agriculture, industry, hydropower, and recreation take preference over other uses.[76]

This allocation is primarily for surface water, but the Arkansas Natural Resource Commission also monitors and regulates groundwater through the Arkansas Groundwater Protection and Management Act. Through this act, the Commission designates critical groundwater areas and then is able to regulate specifically those designated areas. The Commission has designated at least three critical ground water areas in Arkansas, all of which are composed in part by the Sparta aquifer or the MRVA. Once an area is designated as a critical ground water area, the Commission must then determine whether regulation is necessary.[77] If regulation is necessary, then the ANRC can require users to obtain water rights in order to withdraw groundwater from the designated area.[78] These regulations on groundwater are based on the nearly identical criteria used for allocating surface water and reference the same priorities of use for sustaining life, maintaining health, and increasing wealth.

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[69] *SGMA Groundwater Management*, CAL. DEP'T OF WATER RES., https://water.ca.gov/Programs/Groundwater-Management/SGMA-Groundwater-Management (last visited Sept. 27, 2018).
[70] *History*, EDWARDS AQUIFER AUTH., https://www.edwardsaquifer.org/eaa/history (last visited Sept. 28, 2018).
[71] *See* Edwards Aquifer Authority v. Day, 369 S.W.3d 814 (Tex. 2012). The permit system has opened up the Edwards Aquifer Authority to takings claims, however.
[72] ARK. CODE ANN. § 15-22-201.
[73] ARK. NATURAL RES. COMM'N, *supra* note 32, at 12.
[74] ARK. CODE ANN. § 15-22-217.
[75] *Id.*
[76] *Id*.
[77] *Id.* at § 15-22-909; ARK. ADMIN. CODE § 138.00.6-403.2.
[78] *Id*. § 15-22-909; ARK. ADMIN. CODE § 138.00.6-404.2

In Louisiana, a lot of the state's water comes from surface water. However, there is a growing concern for the amount of pollution that accumulates in surface water sources since Louisiana is essentially the end of the line for American waterways such as the Mississippi River.[79] Also, research from the Ground-Water Resources of the Greater New Orleans Area found that saltwater encroachment from the Gulf of Mexico is an additional threat to the Mississippi River and Louisiana's water resources. Even though Louisiana is considered a water rich state, the water in the state is not evenly distributed. Louisiana is experiencing considerable groundwater issues, especially in the Baton Rouge area. Groundwater in the state is not only at risk from the amount used in the state, but also from withdrawals in Arkansas, Texas, and Mississippi.

To combat the threats to groundwater in the Baton Rouge area, the Louisiana legislature created the Capital Area Ground Water Control Commission to regulate groundwater use in what is referred to as the "District."[80] The District is generally Baton Rouge and the surrounding area. The Commission requires registration of wells in the District with some exceptions for which wells need to be registered and which do not.[81] The legislature also established a Ground Water Management Commission intended to regulate large wells throughout the state, as well as any new wells in what the Commission deems to be an area of groundwater concern.[82] The Commission must go through a detailed process in order to designate an area as an area of groundwater concern. [83] These two commissions are recent progress within the state to monitor and regulate groundwater use.

V. Additional Factors Regarding the Use of Water

Water law is not the only factor influencing the use of the MRVA and Sparta Aquifers. Other policies and activities affect water use in the region. Those factors may include the role of water management districts, the use of drainage tiles, and other projects concerning aquifer storage and recovery. Each of these is discussed below.

a. Role of Water Management Districts

Water management districts could play a significant role in how water is used in an area. Water management has been defined as "the activity of planning, developing, distributing and managing the optimum use of water resources. In an ideal world, water management planning has regard to all the competing demands for water and seeks to allocate water on an equitable basis to satisfy all uses and demands."[84] The role of water management districts in Mississippi, Arkansas, Louisiana, Tennessee, and Missouri is discussed below.

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[79] James M. Klebba, *Water Rights and Water Policy in Louisiana: Laissez Faire Riparianism, Market Based Approaches, or a New Managerialism?*, 53 LA. L. REV. 1779 (1993).
[80] LA. ADMIN CODE. tit. 56, § 125.
[81] *Id.* at §§ 101, 105.
[82] LA. REV. STAT. ANN. § 38:3097.6.
[83] *Id.*
[84] *Water Management*, MISS. WATER RES. ASS'N, http://www.mswater.org/members/water-management/ (last visited Sept. 27, 2018).

i. Mississippi

Mississippi has five active water management districts. Each district has a particular mission, but their overall goal is to optimize the use of water while minimizing environmental impacts. The Pat Harrison Waterway District manages the rivers and their tributaries along the Pascagoula River Basin and focuses on flood control, water management, and recreation. The Pearl River Valley Water Supply District focuses on recreational uses. The Tombigbee River Valley Water Management District assists in federal water projects, flood control, and development of water-related resources. The Town Creek Master Water Management District manages Lee, Pontotoc, Pretiss, and Union counties. The Yazoo Mississippi Delta Joint Water Management District generally manages the Delta and was created to "provide local, non-regulatory solutions to the Delta's growing water resource challenges."[85] Mississippi statute dictates that these districts:

> may be created for the purpose of establishing a water supply system, conserving water resources, developing additional water resources or any other water or wastewater management function not being performed by an existing water management district.[86]

In addition to its water management districts, Mississippi has 82 soil and water conservation districts.[87]

ii. Arkansas

There are approximately 75 soil and water conservation districts in Arkansas.[88] Soil and water conservation districts in Arkansas are considered political subdivisions of the state. Local resident landowners can vote to form a district for the purpose of managing soil and water resources at the local level.[89] Arkansas also has Irrigation, Drainage, and Watershed Improvement Districts that are meant to construct, operate, or maintain water management infrastructure like reservoirs and levees.[90] Landowners in Arkansas can also petition to form these districts for the purpose of coordinating irrigation, drainage improvement, and flood control in the area. Among other powers, these districts can acquire water rights to carry out the district's purpose.[91] Finally, Arkansas has also created Regional Water Distribution Districts.[92] About 30 of these districts have been formed, and the districts have broad authority, including being used to supply water for agricultural purposes.[93]

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[85] YAZOO MISS. DELTA JOINT WATER MGMT. DIST., WATER MANAGEMENT PLAN (2006), http://www.ymd.org/pdfs/Water%20Mgmt%20Plan%20to%20DEQ%20Jan06.pdf (last visited Sept. 27, 2018).
[86] MISS. CODE ANN. § 51-8-3.
[87] District Assistance, Miss. Soil & Water Conservation Comm'n, http://www.mswcc.ms.gov/Pages/District%20Assistance.aspx (last visited Sept. 28, 2018).
[88] *Welcome to AACD!*, ARK. ASSOC. OF CONSERVATION DISTRICTS, https://aracd.org/default.htm (last visited Sept. 28, 2018).
[89] *Id.*
[90] ARK. CODE ANN. § 14-117-201.
[91] *Id.* at § 14-117-304(a).
[92] *Id.* at § 14-116-102.
[93] ARK. NATURAL RES. COMM'N, *supra* note 32, at 27.

iii. Louisiana

The Public Works and Water Resources Division of Louisiana provides assistance to eight non-coastal levee districts to help manage their levees, as well as statewide reservoir management.[94] In addition, the division has been directed to create a "reservoir development priority program" to be included in the state's water plan.[95] Louisiana also has 44 soil and water conservation districts. Like other states, these districts are formed by local landowners and operate as a unit of local government.[96]

iv. Tennessee

The Tennessee Department of Environment and Conservation's Division of Water Resources has a watershed management approach that does not necessarily manage watersheds, rather it is a "decision-making process that reflects a strategy for information collection and analysis" to synchronize planning and monitoring of watersheds in the state.[97] Tennessee also has 95 soil and water conservation districts, which are split into the regions of East, Middle, and West Tennessee.[98]

v. *Missouri*

Missouri has 114 soil and water conservation districts that were organized pursuant to state law in order to implement the state's soil and water conservation programs. The districts work on the local level to provide landowners with information and technical support "to voluntarily implement soil and water conservation practices that decrease soil erosion and protect water resources."[99]

b. Drainage Tiles

In Missouri, drainage tiles are used to improve agricultural irrigation and drainage, especially during wet periods.[100] Increased technology has made this drainage system more affordable and more accurate. This method of drainage and irrigation is popular in Missouri,

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[94] *Introduction- Public Works and Water Resources Division*, LA. DEP'T OF TRANSP. AND DEV., http://wwwsp.dotd.la.gov/Inside_LaDOTD/Divisions/Engineering/Public_Works/Pages/default.aspx (last visited Sept. 28, 2018).
[95] *Id.*
[96] *Soil and Water Conservation Districts*, LA. DEP'T OF AGRIC. AND FORESTRY, http://www.ldaf.state.la.us/conservation/soil-water-conservation-districts/ (last visited Sept. 28, 2018).
[97] *Watershed Management Approach*, TENN. DEP'T OF ENV'T AND CONSERVATION, https://www.tn.gov/environment/program-areas/wr-water-resources/watershed-stewardship/watershed-management-approach.html (last visited Sept. 28, 2018).
[98] *Home Page*, TENN. ASSOC. OF CONSERVATION DISTRICTS, http://tnacd.org/index.php (last visited Sept. 28, 2018).
[99] *Soil and Water Conservation Districts*, MO. SOIL AND WATER CONSERVATION DIST., https://mosoilandwater.land/ (last visited Sept. 28, 2018).
[100] David Bennett, *Field drainage/sub-irrigation systems in Missouri*, DELTA FARM PRESS, Oct. 27, 2006, https://www.deltafarmpress.com/livestock/field-drainagesub-irrigation-systems-missouri (last visited Sept. 28, 2018).

especially the Bootheel area.[101] Due to the amount of time required for engineers to design each system, drainage tiles are being used and will be used primarily for problem fields that do not benefit from traditional irrigation and drainage methods.

c. Aquifer Storage and Recovery

The EPA has federal regulations governing aquifer storage and recovery that supersede any and all state regulations. Artificial recharge and aquifer storage and recovery wells are regulated by both the EPA and the states and must submit basic well information to one or both of these entities. The main federal regulation is that any artificial recharge or aquifer storage and recovery well does not endanger underground sources of drinking water. Some states require permits that are aimed at ensuring these groundwater sources are protected. The EPA states that there are about nine states that have stringent requirements on the quality of water used for injection into these types of wells. 40 CFR 14.12L is the federal regulation that clearly states that "the movement of fluid containing any contaminant into underground sources of drinking water" is prohibited.[102]

The Underground Injection Control (UIC) program was created under Part C of the Safe Drinking Water Act.[103] Each state must meet federal UIC requirements set forth by 40 C.F.R. 144.[104] UIC programs regulate the injection of fluids underground for storage or disposal.[105] The State of Oregon's UIC program is codified by Oregon Administrative Rules Chapter 340, Division 44.[106] The Oregon's Department of Environmental Quality (DEQ) regulates UIC systems in order to prevent and protect groundwater from being contaminated. In order for the Oregon DEQ to regulate this program, they issue permits to UIC operators, enforces the systems, and revises the applicable rules when necessary.[107] The Oregon DEQ has specific rules regarding who is expressly authorized to operate a UIC system and for who must obtain a permit to do so.[108] Storm water and wastewater can easily get into the groundwater and pollute a state's drinking water source, so regulation of UIC programs is necessary and crucial.[109]

VI. Conclusion

The MRVA and Sparta Aquifers are vital water resources in the region. A review of the state laws and water management in Mississippi, Arkansas, Louisiana, Tennessee, and Missouri lead to the following conclusions:

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[101] *Id.*
[102] *Underground Injection Control (UIC)*, U.S. ENVTL. PROT. AGENCY, https://www.epa.gov/uic/aquifer-recharge-and-aquifer-storage-and-recovery#well_regs (last visited Sept. 28, 2018).
[103] *Overview- Water Quality Permits*, OREGON.GOV, https://www.oregon.gov/deq/wq/wqpermits/Pages/UIC-Overview.aspx (last visited Sept. 28, 2018).
[104] 40 C.F.R. § 144.1.
[105] *Underground Injection Control*, OREGON.GOV, https://www.oregon.gov/deq/wq/wqpermits/Pages/UIC.aspx (last visited Sept. 28, 2018).
[106] *Overview- Water Quality Permits*, *supra* note 103.
[107] *Id.*
[108] OR. ADMIN. R. 340-044-0018.
[109] STATE OF OR., DEP'T OF ENVTL. QUALITY, FACT SHEET- USE OF INJECTION CONTROL SYSTEMS AND GROUNDWATER PROTECTION (2017), https://www.oregon.gov/deq/FilterDocs/uicsandgwprot.pdf (last visited Sept. 28, 2018).

- Mississippi, Arkansas, and Tennessee operate under a regulated riparianism system. Permits are required for both surface and groundwater withdrawals.
- Both Louisiana and Missouri still see themselves as "water rich." However, Louisiana's resources are not evenly distributed throughout the state, and the state has taken many more regulatory steps to manage its water resources.
- Arkansas and Louisiana have developed some special groundwater management programs.
- Missouri uses drainage tiles, which could be concerning considering the lack of water law in the state.
- Mississippi has decided to use litigation against Tennessee rather than cooperatively manage the Sparta aquifer's water resources.

Genetically Modified Organisms in Aquaculture: From Present to Future

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February 2019

AGRICULTURAL & FOOD
LAW CONSORTIUM

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This material is based upon work supported by the National Agricultural Library, Agricultural Research Service, U.S. Department of Agriculture.

Table of Contents

I. Introduction

The term "GMO" generally refers to a plant or animal that has been given new traits through modern genetic manipulation, in one of two ways: 1) genetic material from unrelated species are combined; or 2) heavily modified DNA is inserted into an organism's genetic code.[1] Genetic modification (GM) has been utilized by humans throughout history. For example, selecting organisms with the most desired traits and breeding them is a form of genetic modification. Any offspring the breeding pair yields will possess a combination of their parents' desirable traits to a certain degree. The birth of modern genetic modification, however, didn't occur until the 1970s, when two scientists created the first successful genetically engineered (GE) organism by specifically cutting out a gene from one organism and pasting it into another. In 1980, the U.S. Supreme Court permitted ownership rights over GMOs, thus giving large companies the incentive to develop GM tools that would be both useful and profitable.[2] Since then, genetic engineering has been applied in multiple agricultural contexts, including the creation of GMO salmon for use in aquaculture.

With the advent of modern genetic engineering techniques, GMOs have swiftly become a topic of controversy and public debate. Proponents of GE food argue that the products have generally been proven safe, and genetic engineering of plants and animals helps bolster the world's food supply. However, opponents allege that credible, independent feeding studies conducted long-term do not exist, and, thus, the true safety of GE food is unknown. Additionally, critics residing in the United States cite the current lack of mandatory, federal labeling laws that allow consumers to make informed choices regarding the influence of genetic modification in the products they choose to buy.[3] Further negative arguments allege GE crops threaten farmer sovereignty due to biotechnology companies' freedom to patent GE seeds and animals in the United States.

As genetic modification becomes more pervasive in terrestrial agriculture, the aquaculture industry has shown growing interest, hoping to utilize the technology to increase both the sustainability and productivity of commercial farms. From an environmental perspective, genetic modification can allow farmers to cultivate larger individuals more quickly, potentially reducing the aquaculture industry's reliance on wild fish populations for feed. Economically, the technology could prove beneficial as well, drastically increasing the amount of fish farmers can cultivate and market within a specific time period. However, critics doubt the benefits that cultivation of GE fish and shellfish could yield, arguing that widespread use of the technology carries unknown human and environmental risks. Due to such criticism, as well as the complicated regulatory landscape aquaculturists wishing to market GE fish and shellfish must navigate, the future of genetically modified aquacultural products in the United States is uncertain. This report examines the current role of GMOs in aquaculture, outlines the regulations governing product labeling and sale, and analyzes the factors driving the future of GE fish and shellfish marketed domestically.

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1 *What are GMOs?*, Genetic Literacy Project, https://gmo.geneticliteracyproject.org/FAQ/what-are-gmos/.

2 *Diamond v. Chakrabarty*, 447 U.S. 303, 303, 100 S. Ct. 2204, 65 L. Ed. 2d 144 (1980).

3 As discussed further in this report, while the United States has enacted a mandatory, federal labeling law, it has not yet become enforceable.

II. The Use of GMOs in Aquaculture

a. Cultivation

GMOs used in the context of aquaculture are most commonly discussed in relation to the cultivation of genetically modified species. Most genetic modification at this level aims to increase food production by modifying the expression of growth hormone. Over-production of growth hormone from a fish's pituitary gland increases growth rate mainly due to increased food consumption, but also because of improvement in feed conversion efficiency.[4] Some GE fish are also induced to develop "double muscling," which utilizes genes that grow an extra muscle layer in order to increase meat production.

Perhaps the most noteworthy company utilizing genetic modification in aquaculture is AquaBounty Technologies. AquaBounty, a biotechnology company based in Massachusetts, first developed their GE AquAdvantage salmon with a goal of increasing the productivity of aquaculture. The hybrid Atlantic salmon incorporate a growth hormone-regulating gene from Pacific Chinook salmon, as well as a promoter[5] sequence from ocean pout that acts as an antifreeze protein, thereby enabling the fish to grow year-round instead of only during the spring and summer. The resulting fish can reportedly grow to market size in 16 to 18 months rather than the three years that conventionally cultured salmon require. While these traits may appear quite favorable in farmed fish, AquaBounty has faced significant pushback from the United States in marketing its salmon.

In November 2015, the FDA approved AquaBounty's application to sell AquAdvantage salmon to U.S. consumers, a decision marking the first time a GE animal had ever been approved to enter the U.S. food supply. However, a rider to the 2016 Omnibus Appropriations Act banned its import until the appropriate governmental agency could mandate labels for the product. Following the Omnibus Appropriation Act's passage, the FDA issued an Import Alert for the salmon, meaning that all future shipments of AquAdvantage salmon into the United States could be refused admission without physically examining the product in each shipment. This Alert severely imperiled AquaBounty's plans to market its salmon to U.S. consumers, although the company successfully made its first sale of 4.5 tons of the fish to Canadian customers in July 2017.

b. Feed

Genetic modification can also be utilized in growing crops that help feed commercially farmed fish. Traditionally, fishmeal and oil have been used to feed cultured species, requiring that an average of one to two pounds of fish be used as meal in order to produce one pound of farmed fish. A growing demand for farmed fish means that demand for fishmeal and oil grows as well, therefore putting strain on wild fisheries, from which the fish used in fishmeal are typically harvested. To help combat this strain and encourage sustainability of the industry, aquaculturists are increasingly looking to soy as a feed

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4 "Feed conversion" here references the efficiency with which farmed fish convert feed into meat that can be consumed by humans.

5 In genetics, a promoter is a region of DNA that initiates transcription of a particular gene. Transcription is the first step of gene expression, in which a particular segment of DNA is copied into RNA by the enzyme RNA polymerase.

supplement. Soybeans are one of the world's best non-animal sources of omega-3 fatty acids, healthy proteins, and unsaturated fats, and soy protein can be fed to farmed fish and shellfish to support their growth and development. Doing so can replace anywhere from one-third to one-half of the fishmeal and oil in feeds for many farmed species, thus reducing the need for wild-caught fish. Soybean meal also costs significantly less than most animal meals, including fishmeal.

As of 2014, 94% of the soybeans farmed in America were genetically modified in some way, usually to increase the production of oil production and/or oleic acid.[6] As a result, even when fish themselves are not genetically modified for cultivation purposes, they may have consumed some amount of GE food prior to harvest. Consequently, some have argued that those fish should bear labels disclosing the possible presence of GE material when marketed, while others argue that such a labeling requirement would go too far, as "there is no 'evidence whatsoever of any harmful impacts of GE soy to fish, to humans or to marine ecosystems.'"[7] The use of GE soy in fish feed also raises issues with the sale of aquacultural products in some international markets, as European consumers, for example, are generally reluctant to purchase and consume products from animals fed with GMOs.

III. Current Regulation

a. Federal Law

Until recently, GMOs in the United States were solely regulated under the Coordinated Framework for Regulation of Biotechnology ("Coordinated Framework"). The Coordinated Framework is a risk-based system that ensures new biotechnology products are safe for the environment as well as human and animal health. It is based on existing laws governing conventional (non-organic) products that are designed to protect public health and the environment, and is administered by several federal agencies, including: 1) the USDA's Animal and Plant Health Inspection Service (APHIS); 2) the FDA; and 3) the EPA. Depending on its characteristics, a product may be subject to the jurisdiction of one or more of these agencies, and regulatory officials from the three agencies regularly communicate and exchange information to ensure that any safety or regulatory issues that may arise are appropriately resolved.

Under the Coordinated Framework, plant GMOs are regulated by APHIS under the Plant Protection Act, while GMOs present in food, drugs, and biological products are regulated by the FDA under the Federal Food, Drug, and Cosmetic Act (FFDCA) as well as the Public Health Service Act. GMO pesticides and microorganisms are regulated by the EPA pursuant to the Federal Insecticide, Fungicide, and Rodenticide Act as well as the Toxic Substances Control Act.

The FDA, under its authority to regulate "new animal drugs" (NADs), regulates the use of GMO fish in aquaculture. Under the FFDCA, the FDA generally deems NADs to be unsafe unless the agency has first approved a New Animal Drug Application (NADA) for the particular use of the NAD. Except in cases

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6 *Soy*, NON-GMO PROJECT, https://www.nongmoproject.org/high-risk/soy/.

7 James Wright, *GMO labeling a sticky situation for seafood*, SEAFOODSOURCE (Sept. 1, 2013), https://www.seafoodsource.com/news/environment-sustainability/gmo-labeling-a-sticky-situation-for-seafood.

where the FDA exercises its discretion to decline to require compliance, or where a NAD is statutorily exempt, the FDA requires that a GE animal gain approval through a NADA based on a demonstration that it is safe and effective for its intended use. Such a NADA must include information regarding the animal's identification; chemistry; clinical purpose; labeling; components and composition; manufacturing methods, facilities, and controls; safety and effectiveness; and environmental impact, among other things.[8]

In addition to the Coordinated Framework, President Obama signed the National Bioengineered Food Disclosure Law ("Disclosure Law") into effect in 2016, which amends the Agricultural Marketing Act of 1946, and requires that the federal government establish rules governing the labeling of GMO products within two years of enactment. Specifically, the Disclosure Law charges the USDA's Agricultural Marketing Service (AMS) with establishing a standard for disclosing the presence of bioengineered ingredients in a rule entitled the National Bioengineered Food Disclosure Standard ("National Standard"). The USDA published its final rule on the National Standard on December 21, 2018,[9] with enforcement anticipated to commence on January 1, 2020. The specifics of the final rule and its potential impact on GE aquacultural products are discussed later in this report.

b. State Law

State law matters little in the regulation of GMO labeling in the United States. The doctrine of "federal preemption" bars conflicting state regulations when Congress either expressly or impliedly intends for federal law to fully occupy a particular field. The Disclosure Law—promulgated in response to Vermont's efforts to regulate GMO labeling and disclosure requirements within its borders—expressly overturns all active state legislation related to GMO labeling and preempts any further state laws. However, the Disclosure Law does permit states to enact GMO disclosure laws that are identical to the National Standard. In preempting state GMO regulations through the Disclosure Law, the federal government avoids the possibility that a patchwork of labeling laws are enacted across the country, with varying requirements and stringency from state-to-state.

States do, however, have the ability to create laws that wholly prohibit GE animal species from being imported into their borders. In the context of aquaculture, these types of regulations are often created to prevent the harm that accidental introduction of GE fish or shellfish into native waterbodies could impose. Delaware, for example, has adopted such a regulation into its Administrative Code. The state first defines "non-native finfish species" to include genetically modified, native species of fish.[10] It then defines "invasive finfish species" to include such non-native finfish species (as well as their eggs and other biological material) that are capable of spreading, reproducing, or propagating, and whose introduction or proliferation either causes or is likely to cause economic or environmental harm or harm to human

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8 Luis Acosta, *Restrictions on Genetically Modified Organisms: United States*, Library of Congress (Mar. 2014), https://www.loc.gov/law/help/restrictions-on-gmos/usa.php#_ftn57.

9 7 C.F.R. § 66 (2018).

10 Del. Code Ann. tit. 7, § 9.942(a)(2).

health or safety.[11] The State is permitted to authorize, regulate, prohibit, prescribe, or restrict anywhere in Delaware the acquisition, importation, introduction, possession, transportation, disposition, or release into public or private tidal waters any such invasive finfish species (including their eggs and other biological material).[12] In effect, this allows the state to prevent GE aquacultural products from entering the state, so long as they fall within the scope of the regulation's definitions. In another example, Florida requires certified aquaculturists to receive state authorization before culturing GE fish species, and authorization will only be considered if such culture will not pose a threat to the public health, safety, and welfare.[13] Regulations such as these can limit the states in which GE aquacultural products can be propagated and perhaps even marketed.

IV. Third-Party Labeling

Producers not required to disclose the presence of GMOs in their foods under the Disclosure Law may wish to signify the absence of such through the use of third-party labels. Even those entities that must mandatorily disclose may choose to utilize additional, third-party labels on their products' packaging to denote satisfaction of different, perhaps more stringent standards. Third-party labeling certifications are created from private, voluntary standards, and can serve as informative markers for consumers. While third-party labelers set their own standards, they use unbiased, non-stakeholder entities to verify that such standards are being met. Furthermore, many third-party certifiers implement a public comment or consumer-driven consultation period to incorporate feedback and critique in shaping their standards. Such opportunities help build trust among manufacturers and consumers utilizing the labels.

Perhaps the most commonly utilized third-party certifier of non-GMO products is the Non-GMO Project. Its Project Product Verification Program is currently North America's only third-party labeling certification for non-GMO food and products.[14] In order to become verified through the Program, manufacturers must work with an outside technical administration company that provides unbiased evaluations on a product's ingredients as well as the facility in which it is manufactured. After successful verification, the technical administration company issues a certificate of compliance, and the manufacturer can begin using Non-GMO Project labels on the packaging of any verified products. Consumers can easily access the Non-GMO Project's own standards online, thus increasing their confidence that a product bearing the third-party label meets certain criteria. Use of third-party labels can also increase revenue for producers as consumers continue to demand higher quality standards in the products they buy. Even upon federal enforcement of the National Standard, third-party labelers such as the Non-GMO Project can continue to serve an important role for consumers by enforcing different or more stringent labeling requirements that those imposed by the government.

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11 *Id.* at § 9.942(a)(1).

12 *Id.* at § 9.942(b).

13 Florida Department of Agriculture and Consumer Services, Aquaculture Best Management Practices Manual 30 (2016).

14 *About*, NON-GMO PROJECT, https://www.nongmoproject.org/about/.

V. National Bioengineered Food Disclosure Standard Final Rule

The USDA's National Bioengineered Food Disclosure Standard (NBFDS) final rule requires food manufacturers, importers of food labeled for retail sale in the United States, and some domestic retailers to disclose foods and ingredients produced from food that are or may be genetically modified. The rule contains multiple provisions that both directly and indirectly impact the aquaculture industry, including those related to definitions, listed foods, disclosure methods, exemptions from disclosure, and enforcement. Understanding the content of these provisions can help in assessing the marketable future of GE aquacultural products in the United States.

a. Definitions

The NBFDS final rule sets forth many definitions of significance, one of which outlines what foods are subject to the rule's disclosure requirements. Under the NBFDS final rule, "food," as defined by the FFDCA, is generally required to possess labeling disclosing the presence of GMOs only if it is intended for human consumption. Animal feed, for example, would not be required to bear such disclosure labeling. The preamble to the final rule goes on to note that both raw agricultural commodities as well as processed items qualify as "food." Furthermore, dietary supplements, processing aids, and enzymes fall within the scope of the definition.

Additionally, the final rule replaces the popularized term "genetically modified organism" and its abbreviation "GMO" with the term "bioengineered food" and its abbreviation "BE." "Bioengineered food" is defined as food that contains genetic material that has been modified through *in vitro* rDNA techniques and for which the modification could not be otherwise obtained through conventional breeding or found in nature.[15] This definition narrows the general definition of GMO somewhat, making it clear that the National Standard will require disclosure only when foods contain genetic material introduced through bioengineering. As a result, the final rule does not apply to pure oils, starches, and sugars because they do not contain genetic material even when produced from bioengineered crops.[16]

Additionally, the definition specifically excludes foods where modified genetic material is not detectable. To demonstrate this undetectability, an entity must maintain records that either: 1) verify that the food is sourced from a non-BE crop or source; 2) verify that the food has been subjected to a refinement process validated to make the modified genetic material in the food undetectable; or 3) certify that testing or other analysis appropriate to the specific food has been conducted that confirms the absence of modified genetic material.[17]

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15 7 C.F.R. § 66.1.

16 Jacqui Fatka, *USDA* releases final bioengineered food disclosure standard, FEEDSTUFFS (Dec. 20, 2018), https://www.feedstuffs.com/news/usda-releases-final-bioengineered-food-disclosure-standard.

17 7 C.F.R. § 66.9(a) (2018).

b. Listed Foods

The NBFDS final rule next promulgates a single "List of Bioengineered Foods" meant to identify the crops or foods that are both: 1) authorized for commercial production; and 2) reported to be in legal commercial production for human consumption somewhere in the world. The List also helps determine whether a food must bear a BE disclosure. If an entity utilizes a listed food or ingredient on its own, or if a product is sourced from a listed food or product, that entity must maintain records regarding the food or ingredient that help drive the disclosure determination. If a food or food ingredient is present on the List and the entity's records show that the specific food they have utilized is BE, the food must bear a BE disclosure if no exemptions otherwise apply. In the context of aquaculture, the list specifically includes AquaBounty's AquAdvantage salmon, meaning that foods containing the fish either in whole or in part must disclose the presence of BE technology through one of the final rule's listed methods.

The List is not exhaustive, and AMS acknowledges that it may not be complete. Therefore, the agency has stated it will consider revisions to the List annually, soliciting recommendations regarding updates and taking into account supporting information and input from other federal agencies. Following an internal review, AMS will then determine whether to initiate rulemaking to amend the List, and if the List is revised, regulated entities will have 18 months to make updates to their labels as needed.

c. Disclosure Methods

For those entities subject to mandatory disclosure, such disclosures must appear prominently and conspicuously on a product's label, and must also be easily read and understood by consumers. The rule provides four different methods for companies to disclose the presence of GE products in food when modified genetic material is detectable. Companies may either: 1) include clearly written disclosure text on their product's nutrition information panel; 2) place the USDA's new symbol for bioengineered food on the packaging; 3) include a QR code on the packaging that consumers can scan with their smartphones; or 4) include a text message disclosure on the packaging, such as "Text [word] to [phone number] for bioengineered food information." The rule also provides additional disclosure options for small food manufacturers as well as modified disclosure options for small and very small packages.

In addition to mandatory disclosures, the final rule also provides for those entities that wish to voluntarily disclose the presence of BE foods in their products. Entities may choose to do so if either: 1) they are otherwise excepted from the requirements of the NBFDS, but wish to disclose the presence of a food included on the List of Bioengineered Foods;[18] or 2) a food does not meet the definition of "bioengineered food" but is derived from listed BE crops or food.[19] In the latter "derived from" scenario, food cannot act as an incidental additive nor can it be otherwise exempt under 7 C.F.R. § 66.5 in order to qualify for voluntary disclosure.

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[18] An exception from mandatory disclosure could arise either due to the undetectability of BE material in a food product or because of a product or entity's qualification under one of the final rule's five listed exemptions.

[19] 7 C.F.R. § 66.116.

d. Exemptions from Disclosure

In 7 C.F.R. § 66.5, the NBFDS final rule outlines five exemptions that excuse certain entities from the rule's otherwise mandatory disclosure requirements. First, food served in a restaurant or similar retail establishment (including food trucks and transportation carriers) is exempt. AMS also notes that salads, soups, and other ready-to-eat items prepared by grocery stores are additionally exempt. Second, the final rule exempts very small food manufacturers with annual receipts of less than $2.5 million. Third, the rule sets a threshold for the inadvertent or technically unavoidable presence of bioengineered substances. If a BE substance is included in a food in amounts up to 5% for each ingredient, it is exempt from disclosure requirements. Fourth, food derived from an animal is prohibited from being considered a BE food solely because the animal consumed feed produced from, containing, or consisting of a BE substance. Finally, food certified under AMS' National Organic Program (NOP) is exempt. This exemption covers all NOP-certified label categories. As use of genetic engineering is prohibited in products bearing a USDA Organic seal, this exemption stands to reason. Any products bearing the seal will have already undergone certification that they are free of BE substances before being retailed.

e. Enforcement

The final provisions of the NBFDS final rule discuss enforcement. The rule makes it a prohibited act for an entity to fail to make a mandatory BE food disclosure. Those found to have done so will be subject to further investigation by AMS, a record audit, and potential agency-imposed penalties. If an entity subjected to a record audit requests a hearing on the results of that audit, the final rule also includes procedures for how the hearing can be requested as well as AMS' role in reviewing and potentially revising its findings. Ultimately, the summary of the results of an audit or the summary of the final results of an investigation at the conclusion of the hearing will be made public.

The rule's voluntary compliance period for regulated entities other than small food manufacturers[20] begins on January 1, 2020. The compliance period for small food manufacturers begins on January 1, 2021. During this period, regulated entities may use labels that meet the requirements of preempted state labeling regulations for GE food. Stickers or ink stamps may be applied to existing labels to provide appropriate BE food disclosures provided that they do not obscure other required label information. The voluntary compliance period ends on December 31, 2021, and January 1, 2022 marks the beginning of mandatory compliance. By that date, all regulated entities must comply with the requirements of the NBFDS.

VI. The Future of GMOs in Aquaculture

AMS's promulgation of the NBFDS final rule could mean a great deal for the future of cultivated GE salmon in the United States—AquaBounty's AquAdvantage salmon, in particular. With the inclusion of AquAdvantage salmon on the rule's List of Bioengineered Foods, it would seem that the time is drawing near when the FDA may lift the Import Alert and allow the GE fish to enter the U.S. market.

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[20] "Small food manufacturers" are those with annual receipts of at least $2.5 million, but less than $10 million.

However, the FDA must still provide labeling guidance on the fish before it can lift the Alert. While AquaBounty is hopeful that this will happen shortly, it has noted that there are no assurances such guidance will be issued in close proximity to the final rule's promulgation.[21] In the meantime, the company's CEO is having discussions with potential partners outside of North America, including those in China and the Middle East, in order to sell AquAdvantage salmon in other, perhaps more favorable, markets.[22] As the company's current sales to Canada are expected to remain "modest and infrequent," expanding to other markets could be critical for the company, which has not turned a profit in its two-decade history.[23]

However, even if companies culturing GE fish and/or shellfish like AquaBounty are permitted to sell their products in the U.S. market, consumer perceptions may limit the success of such sales. Generally, consumer knowledge of GMOs is low in the United States, according to studies based on direct consumer surveys.[24] A 2013 survey conducted by the School of Environmental and Biological Sciences at Rutgers University found that U.S. consumers as a whole were fairly unknowledgeable about GMOs, with just 43% knowing that GE products were available in supermarkets and only 26% believing that they had most likely consumed a GE product in their lifetime.[25] However, those that did report having familiarity with GMOs tended to prefer non-GE products and show a higher willingness to pay for such products.[26] As the topic of GMOs becomes more commonly discussed in the general media and mandatory labeling laws go into effect, increasing familiarity with genetic modification could drive some consumers away from purchasing products created using the technology. Certain private retailers may be reluctant to stock GE products as well. Producers will have to find a way to overcome such negative perceptions surrounding genetic modification if they wish to find true success in marketing GE aquacultural products.

The implications of using GE feed in commercial aquaculture are now clearer since the promulgation of the NBFDS final rule. As noted above, there exists a question of whether fish at least partially fed GE crops would be required to bear disclosure labeling when packaged for sale. The final rule clears this up somewhat by prohibiting food derived from an animal from being considered BE solely because the animal consumed feed produced from, containing, or consisting of a BE substance. However, the inclusion of the word "solely," indicates that feeding non-GE animals GE crops could play some part in determining whether an animal product must bear a BE disclosure. It remains to be seen whether this would actually be the case in practice, and, if so, exactly what such a determination would look like.

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21 Christine Blank, *New labeling rule paves way for GM salmon to enter US market* (Dec. 21, 2018), https://www.seafoodsource.com/news/supply-trade/new-labeling-rule-paves-way-for-gm-salmon-to-enter-us-market.

22 Jason Smith, *With new CEO, AquaBounty looks beyond US for markets, partner*, Undercurrent News (Jan. 16, 2019), https://www.undercurrentnews.com/2019/01/16/with-new-ceo-aquabounty-looks-beyond-us-for-markets-partner/?utm_source=Undercurrent+News+Alerts&utm_campaign=72054c9e5b-Americas_briefing_Jan_16_2019&utm_medium=email&utm_term=0_feb55e2e23-72054c9e5b-92659481.

23 *Id.*

24 Shahla Wunderlich & Kelsey A. Gatto, *Consumer Perception of Genetically Modified Organisms and Sources of Information*, 6 Advances in Nutrition 842 (2015), *available at* https://academic.oup.com/advances/article/6/6/842/4555145.

25 William K. Hallman et al., Rutgers School of Environmental and Biological Sciences, Public Perceptions of Labeling Genetically Modified Foods 4 (2013), *available at* http://humeco.rutgers.edu/documents_PDF/news/GMlabelingperceptions.pdf.

26 *Id.* at 5.

VII. Conclusion

There are still many questions that must be answered before GE aquacultural products can succeed in the U.S. market. It is unclear if the marketing of such products will be met with more political backlash, and it is also uncertain how American consumers will respond. The first companies to successfully market their products domestically—AquaBounty in particular—will yield great insight into how the U.S. views GE fish and shellfish as a whole. It also remains to be seen exactly what impact new policies such as the NBFDS final rule will have on the aquacultural GMOs. Proponents of the rule are hopeful that it will provide necessary transparency for consumers by allowing them to make informed decisions while protecting the innovation that is critical to the sustainability of agriculture. However, critics argue that the way the USDA has written the rule will erode consumer confidence by providing unwarranted exemptions and utilizing unfamiliar terms such as "bioengineered." Whatever the result, aquaculturists wishing to utilize genetic modification should familiarize themselves with relevant federal and state regulations as well as the requirements of third-party certification programs in order to best prepare for the future.

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[27] Phillip Brasher & Spencer Chase, *USDA issues GMO disclosure rules*, AGRI-PULSE (Dec. 20, 2010, 10:00 AM), https://www.agri-pulse.com/articles/11754-usda-issues-gmo-disclosure-rules.

[28] *Id*.

CFAES OHIO STATE UNIVERSITY EXTENSION

In the Weeds

THE OHIO STATE UNIVERSITY
COLLEGE OF FOOD, AGRICULTURAL, AND ENVIRONMENTAL SCIENCES

Digging into current legal issues with OSU Extension's Farm Office *February 8, 2019*

The Lake Erie Bill of Rights Ballot Initiative

*Peggy Kirk Hall, Ellen Essman, and Evin Bachelor**
OSU Extension Agricultural & Resource Law Program

Check out this *In the Weeds* briefing for:

- An explanation of Toledo's Lake Erie Bill of Rights petition.
- What the petition says.
- Legal challenges to keep the issue off Toledo's ballot.
- "Community rights" efforts in Ohio and around the country.
- Who has rights in Lake Erie?
- Rights of corporations.
- Quick answers to frequently asked questions.

Lake Erie once again made headlines when the Ohio Supreme Court recently decided that a "Lake Erie Bill of Rights" initiative could be placed on the Toledo ballot on February 26, 2019. The decision raised alarm in Ohio's agricultural community and fears that, if passed, the measure will result in litigation for farmers in the Lake Erie watershed. In this brief, we dig into the Lake Erie Bill of Rights (LEBOR) and explain the laws that relate to this important issue.

LEBOR is a proposed amendment to the Toledo City Charter. The "Toledoans for Safe Water" initiated the LEBOR petition to amend Toledo's city charter.[1] A "charter" is like a "constitution" in that it outlines a city's powers and how the city will function. The Ohio Constitution allows city residents to propose charter amendments through a petition process that requires signatures by 10 percent or more of the electors in order to place a proposal on the ballot.[2]

A look at the LEBOR petition. The LEBOR petition attempts to create a new way for Toledo citizens to protect the Lake Erie resource by granting new legal rights for Lake Erie, its ecosystem and allowing Toledo and its residents to enforce those legal rights against any government or corporation that violates them. Here's an explanation of the three primary parts of the petition:

1. *Declarations of the purpose of the petition.*
   - The petition declares an immediate emergency in order to protect Lake Erie and its watershed from irreversible devastation caused by the combination of global warming and continued dumping of industrial wastes and runoff of noxious substances into the lake.
   - This emergency requires shifting from current voluntary and regulatory policies to adopting laws that prohibit such activities and protect the fundamental rights of the people of Toledo. The people must assert their inherent and inalienable rights as stated in the Ohio Constitution and must extend legal rights to the natural environment.
   - Since the Ohio Constitution also provides that all political power of governance is inherent in the people, the people of Toledo declare and enact a Lake Erie Bill of Rights to establish irrevocable rights for the Lake Erie Ecosystem to exist, flourish and naturally evolve, a right to a

healthy environment for the residents of Toledo, and to elevate the rights of the community and its natural environment over powers claimed by certain corporations.

2. *Statements of law proposed by the petition*.
   - Section 1 of the petition lays out three broad "rights" that are inherent, fundamental and unalienable, self-executing and enforceable against both public and private actors:
     - *Rights of Lake Erie Ecosystem*, which include the rights of Lake Erie and its watershed to exist, flourish, and naturally evolve.
     - *Rights to a clean and healthy environment* for the people of Toledo, which includes the right to a clean and healthy Lake Erie and Lake Erie ecosystem.
     - *Rights of local community self-government*, which include a right to a system of government that embodies self-government and protects and secures the human, civil and collective rights of the people of Toledo.
   - Section 2 states two sources of "violations" of LEBOR:
     - It shall be unlawful for any corporation or government to violate the "rights" established in Section 1. A corporation includes any business entity.
     - No permit, license, privilege, charter, or other authorization issued to a corporation, by any state or federal entity shall be deemed valid within Toledo if it would violate the prohibitions or the rights secured by LEBOR.
3. *Enforcement provisions proposed by the petition*.
   - Section 3 presents how LEBOR would be enforced:
     - Any corporation or government that violates LEBOR shall be guilty of an "offense" and sentenced to pay the maximum fine allowable under State law for that violation.
     - The city of Toledo or any resident may enforce LEBOR through an action in the Lucas County Court of Common Pleas and shall be entitled to recover costs of the litigation.
     - Governments and corporations shall be strictly liable for harms and violations of rights.
     - The Lake Erie Ecosystem may enforce its rights through an action prosecuted by the City or a resident in the name of the Ecosystem. Damages shall be the cost of restoring the Ecosystem to its status previous to the acts that caused the injury, to be paid to the City.
   - Section 4 states how LEBOR relates to other laws:
     - Corporations that violate LEBOR shall not possess any other legal rights that would interfere with LEBOR, including the right to assert state or federal preemptive laws.

Legal challenges to putting LEBOR on Toledo's ballot. LEBOR's road to Toledo's special election ballot has been rocky and fraught with legal challenges that ended in a recent holding by the Ohio Supreme Court.[3] An opponent of the petition argued that LEBOR exceeded Toledo's authority and filed an action for a "writ of prohibition"—a court order that would require the Lucas County Board of Elections to remove LEBOR from the ballot. The Supreme Court did not grant the request and instead determined that the board's decision to place LEBOR on the ballot was not unlawful because "a board of elections has no legal authority to review the substance of a proposed charter amendment and has no discretion to block the measure from the ballot based on an assessment of its suitability." The Court pointed to past cases it had decided and the Ohio Constitution's provision stating that if 10 percent of the voters in a municipality sign a petition, the city council must then pass an ordinance to include the proposed amendment on the ballot. According to the Court, the only responsibility of the board was to put the charter amendment on the ballot—the board has no other authority to review the content of the

charter amendment.[4] Note that the outcome has been different for community rights provisions that are proposed as ordinances, the statutory laws that govern a city. Ohio courts have determined that the Ohio Revised Code grants a city the authority to review the substance of a ballot initiative that is introduced as an ordinance rather than as a charter amendment.[5]

The "community rights" approach behind LEBOR. LEBOR is an example of a "community rights" effort that seeks to give power back to communities. Organizations that promote community rights push for a fundamental shift in the legal system by developing new laws to protect community rights, which include the "rights of nature." These new laws grant human rights to nature and natural objects. The Community Environmental Legal Defense Fund (CELDF), one group behind LEBOR, calls for the establishment of "rights of nature," such as "the right of ecosystems to flourish and evolve."[6] Toledo's LEBOR petition contains this same language. Since nature cannot communicate, it cannot represent itself in court or select its legal counsel. Community rights approaches remedy this problem by granting persons or organizations the right to enforce the legal rights of nature in a court of law on behalf of the natural object, which ultimately also aims to protect the rights of the community.

Legal challenges to "community rights" provisions. Even when a local community amends its charter or ordinances to include community rights language like LEBOR's, courts have routinely refused to enforce the provisions. Academic scholarship argues that many of the community rights proposals violate long standing legal doctrines regarding federal supremacy over states, state supremacy over local governments, and constitutional rights given to corporations.[7] The decisions are too numerous to include in this briefing, but here's a sampling of court decisions from Ohio and around the country:

- Columbus, Ohio. A proposed ordinance (not a charter amendment) for a "Community Bill of Rights for Water, Soil, and Air Protection" stated that natural communities and ecosystems, including wetlands, streams, rivers, aquifers, and other water systems, "possess the rights to exist and flourish within the City of Columbus." The Ohio Supreme Court determined that the proposal created a new cause of action and was beyond a city's legislative power.[8]
- Youngstown, Ohio. Citizens proposed a "Youngstown Drinking Water Protection Bill of Rights" that created rights for ecosystems and natural communities, similar to LEBOR. The Ohio Supreme Court initially deemed that the rights were "beyond the scope of the municipality's authority to enact."[9] The Court later invalidated the decision because it erred by treating the proposal as an ordinance rather than a charter amendment, which cannot be reviewed on substance, as explained above.[10]
- Spokane, Washington. The Washington Supreme Court agreed that a community rights amendment to Spokane's city charter exceeded the city's authority with respect to "administrative matters, water law, and constitutional rights."[11] The amendment sought to give legal rights to the Spokane River.
- Mora County, New Mexico. CELDF drafted the "Mora County Community Water Rights and Local Self Government Ordinance," which established community rights that sought to ban oil and gas extraction activities in the county. A federal court struck down the ordinance for violating the U.S. Constitution's Supremacy Clause and First Amendment and conflicting with New Mexico law.[12]
- Pennsylvania. Courts have struck down many efforts to ban oil and gas development in Pennsylvania through a community rights approach. In one case, the court held that an ordinance on "Eliminating Legal Powers and Privileges from Corporations Doing Business Within Blaine Township to Vindicate the Right to Democratic Self-Governance" was preempted by state law, constituted an impermissible exercise of police power, and violated the Constitution's Supremacy Clause. [13]

Community rights actions and attorney sanctions. Not only have community rights cases failed to succeed in court, but lawyers who have brought lawsuits under community rights provisions have been sanctioned and ordered to pay those they have sued for engaging in "harassment," "unbridled obstruction," and arguing "frivolous claims and defenses."[14] In a recent Pennsylvania case, the court chastised the attorneys and their organization for pursuing "a discredited and previously litigated "community rights" approach to prevent oil and gas operations" and inappropriately seeking to deny others of constitutional rights.[15] In addition to making a rare award of $52,000 in sanctions against the CELDF's attorneys, the magistrate in the case referred CELDF's executive director to the Disciplinary Board of the Supreme Court of Pennsylvania[16] but the board did not take action against the attorney.

Who has rights in Lake Erie? The State of Ohio owns the Ohio portion of Lake Erie in trust for the people of Ohio and a city cannot usurp the State's sovereign rights in Lake Erie without the State's express permission.[17] The State of Ohio's rights in Lake Erie stem from its inherent powers as a sovereign signatory to the United States Constitution. That is a high status for the State of Ohio, but cities lack sovereign status because cities are creatures of the state according to federal constitutional law.[18] In exercising its power as a sovereign over portions of Lake Erie, Ohio designated the Ohio Department of Natural Resources as the state's only designee "in any matter pertaining to the care, protection, and enforcement of the state's rights" in Lake Erie.[19] LEBOR attempts to claim rights from the State of Ohio and transfer them to Toledo and its residents, but there is no legal authority for doing so. Much like Ohio, the State of Michigan also holds its portion in trust for its people, and the Canadian Province of Ontario governs the portion of Lake Erie north of the international boundary.

LEBOR and the rights of corporations. LEBOR states that a government or corporation, defined as any business entity, may not violate the rights of Lake Erie and also declares that corporations "shall not possess any other legal rights that would interfere with LEBOR, including the right to assert state or federal preemptive laws." While controversial, courts have adhered to a long line of decisions that grant "personhood" and certain constitutional rights to corporations.[20] Specifically, courts have determined that the U.S. Constitution's Equal Protection Clause, which requires that the law treat all individuals in the same manner as others, applies to corporations because corporations exist to protect the interests of their owners and therefore must be able to assert those interests in litigation.[21] LEBOR's focus on enforcement against corporations but not individuals and its removal of legal rights for corporations appears to directly conflict with such legal precedent.

What does it all mean? The LEBOR initiative is similar to many other community rights proposals that seek to establish rights of nature that community members can protect through legal action. Such efforts have a bad track record in courts nationwide. Courts have consistently determined that the provisions conflict with longstanding constitutional principles that address the relationship between federal, state and local governments; state and local governments cannot eliminate federal rights and local governments cannot deny rights granted by the state. Community rights initiatives also conflict with legal precedent established by the U.S. Supreme Court that guarantees corporate entities constitutional rights. Finally, the State of Ohio holds rights in Lake Erie that Toledo and its residents do not have legal authority to claim. Based upon these legal precedents, it is likely that an Ohio court would not enforce or uphold a LEBOR action.

Quick answers to Frequently Asked Questions about LEBOR. We've heard many questions and concerns about the potential impacts of LEBOR on farmers, corporations and others in the Lake Erie watershed if Toledo voters approve the measure. Based upon our research, we offer the following responses to these questions:

- *"If passed, will LEBOR lead to more regulations?"* LEBOR's language does not create regulations that must be followed, nor does it attempt to give any regulatory authority to any office or organization. It purports to be "self-executing." On its own, it would only allow the City of Toledo or citizens of Toledo to bring a legal action for an alleged violation of Lake Erie's legal rights.

- *"Will this approach spread statewide?"* Community rights initiatives in Ohio have been limited to several local efforts to amend municipal charters or ordinances with community rights language. There are organizations that are willing to help other communities advance similar community rights initiatives. To our knowledge, there has not been an attempt to expand community rights on a statewide basis. Doing so would require a petition to be put on a statewide ballot or an action by the Ohio General Assembly and the administration of Governor DeWine.

- *"Could LEBOR prevent farmers from farming?"* The petition creates a legal cause of action that someone could assert against a government or corporation that violates the rights of the Lake Erie ecosystem. The remedies provided in LEBOR are for monetary damages only and do not create a right to seek an "injunction" that would prevent a farmer from farming.

- *How will LEBOR affect Toledo residents whose lawn chemicals or other discharges get into Lake Erie?* While LEBOR states that its purpose is to protect Lake Erie, it does so only by targeting the actions of governments and corporations. It does not provide a legal action to be used against individuals who violate the proclaimed rights of Lake Erie.

- *"What should I do if a lawsuit is brought against me because of LEBOR?"* Contact your attorney and insurance company as soon as possible whenever faced with a lawsuit. Depending upon the situation and your insurance coverage, it is possible that your insurance company will defend the claim to protect not only you but also the interests of its other policyholders. If your insurance provider will not defend you, you will need the services of a personal attorney. Either way, you must file an answer to the claim within 28 days.

- *"How does LEBOR relate to nuisance lawsuits like those happening in North Carolina?"* LEBOR is different than farm nuisance lawsuits, which allege that a farm's activities unreasonably interfere with the quiet use and enjoyment of another's property. The new cause of action LEBOR attempts to create is based on harm to the Lake Erie resource rather than to someone's property rights. Note also that farms sued for nuisance in North Carolina could not use the state's Right to Farm statute, which is less protective of agriculture than Ohio's Right to Farm law. An in depth explanation of the Right to Farm laws is available on the Farm Office's Ag Law Blog.[22]

FOR MORE INFORMATION FROM OSU EXTENSION'S AGRICULTURAL & RESOURCE LAW PROGRAM:

- Visit our website at http://farmoffice.osu.edu.
- Sign up at http://farmoffice.osu.edu/blog to receive our blog postings by e-mail with timely articles on legal issues of importance to Ohio agriculture.
- Contact us by e-mail at aglaw@osu.edu.

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[1] "The Lake Erie Bill of Rights Citizens Initiative," TOLEDOANS FOR SAFE WATER (accessed Feb. 8, 2019) http://lakeerieaction.wixsite.com/safewatertoledo.
[2] OHIO CONSTITUTION, Article XVIII, Sections 8 and 9.
[3] *State ex. rel. Abernathy v. Lucas County Board of Elections*, Slip Opinion No. 2019-Ohio-201.
[4] OHIO CONSTITUTION, Article XVIII, Sections 8 and 9. *See also State ex. rel. Maxcy v. Saferin*, Slip Opinion No. 2018-Ohio-4035. *State ex. rel. Maxcy v. Saferin*, Slip Opinion No. 2018-Ohio-4035 at 10, *quoting State ex rel. Commt. for Charter Amendment Petition v. Avon*, 81 Ohio St.3d 590, 592, 693 N.E.2d 205 (1998).
[5] *See State ex. rel. Maxcy v. Saferin*, Slip Opinion No. 2018-Ohio-4035 at 4-7.
[6] "Community Rights," COMMUNITY ENVIRONMENTAL LEGAL DEFENSE FUND (accessed Feb. 6, 2019) https://celdf.org/community-rights/.
[7] Stephen R. Miller, *Community Rights and the Municipal Police Power*, 55 SANTA CLARA L. REV. 675, 724 (2015) ("many [community rights ordinances] rest on largely untenable positions relative to supremacy and preemption, state law constructions of local government power, and corporate personhood doctrines all several centuries in the making").
[8] *State ex. rel. Bolzenius v. Preisse*, Slip Opinion No. 2018-Ohio-3708.
[9] *State ex rel. Flak v. Betras*, 152 Ohio St.3d 244, 2017-Ohio-8109.
[10] *See State ex. rel. Maxcy v. Saferin, Slip Opinion No. 2018-Ohio-4035* at 6-7.
[11] *Spokane Entrepreneurial Center v. Spokane Moves to Amend the Constitution*, No. 91551-2 (Wa. Feb. 4, 2016).
[12] *SWEPI, LP v. Mora County, New Mexico*, 81 F.Supp.3d 1075 (D. N.M. 2015).
[13] *Range Resources – Appalachia, LLC v. Blaine Township*, 649 F.Supp.2d 412 (W.D. Pa. 2009); *Penn Ridge Coal, LLC v. Allegheny Pittsburgh Coal Co.*, C.A. No. 08-1452P, ECF No. 30 (W.D. Pa. Apr. 8, 2009).
[14] *Pennsylvania General Energy Co., LLC v. Grant Township*, C.A. No. 14-209ERIE at 24-25 (W.D. Pa. Jan. 5, 2018).
[15] *Id.* at 17.
[16] *Id.* at 1, 25.
[17] Ohio Attorney General Opinion No. 455, p. 661 (May 27, 1929) https://www.ohioattorneygeneral.gov/getattachment/2f84e380-5fd4-4ab4-ba6b-7f954bea0c5e/1929-0445.aspx.
[18] *Hunter v. City of Pittsburg*, 207 U.S. 161 (1907).
[19] Ohio Revised Code § 1506.10, "Lake Erie boundary lines."
[20] See Brandon L. Garrett, *The Constitutional Standing of Corporations*, 163 U. PENN. L. REV. 95 (2014).
[21] See *Metro. Life Ins. Co. v. Ward*, 470 U.S. 869 (1985).
[22] Ellen Essman, "North Carolina's Smithfield Lawsuits: Could Ohio Farmers Face Similar Results?," *Ohio Agricultural Law Blog*, OHIO STATE UNIVERSITY EXTENSION FARM OFFICE (Nov. 14, 2018) https://farmoffice.osu.edu/blog/wed-11142018-550pm/ohio-agricultural-law-blog-north-carolina's-smithfield-lawsuits-could-ohio.

Factsheet Series: 2019

Agritourism Immunity Laws in the United States

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This material is based upon work supported by the National Agricultural Library, Agricultural Research Service, U.S. Department of Agriculture.

Agritourism offers a growing business opportunity for farmers and ranchers. According to the 2012 U.S. Census of Agriculture, the number of farms and ranches receiving income from agritourism grew from 23,350 in 2007 to 33,161 in 2012 and more than 4,500 of those operations had gross receipts of over $25,000 from agritourism.[1] Entertaining visitors is an increasingly popular source of revenue for farms and ranches today.

Running an agritourism business is not without its challenges, however. One primary concern is the possibility that a visitor will be hurt while on the farm. The types of experiences that guests desire from a farm or ranch are inherently risky, such as picking produce, feeding livestock, climbing on straw bales, engaging in recreational activities, and riding on wagons, tractors and horses. If a visitor suffers harm while voluntarily engaging in risky agritourism activities, should the farmer or rancher be liable for that harm?

State legislatures have addressed this liability question by enacting agritourism immunity laws that protect agritourism businesses from liability in certain situations. While it is always imperative for farmers and ranchers to use best management practices to reduce the risk that a participant will be injured, these laws can manage the risk of financial

responsibility for harm to visitors who choose to engage in agritourism activities. Before venturing into the business of agritourism, it's important for a farmer or rancher to know whether a state has an agritourism immunity law and if so, how to ensure compliance with the statute. In this fact sheet, we review agritourism immunity laws in the U.S. and explain different approaches and key provisions in the laws.

States with immunity laws for agritourism

In 2004, Kansas became the first state to enact a liability protection law for farmers and ranchers that offer agritourism activities on their land. Many states followed suit, and the 31 states listed below now have an immunity law that can shield an agritourism business from liability for visitor injuries in certain circumstances. To read a state's specific law, visit our compilation of States' Agritourism Statutes at http://nationalaglawcenter.org/state-compilations/agritourism/.

States with agritourism immunity laws for agritourism businesses		
Alabama	Maine	Oregon
Alaska	Minnesota	South Carolina
Arkansas	Mississippi	Tennessee
Colorado	Missouri	Texas
Florida	Montana	Utah
Georgia	Nebraska	Virginia
Idaho	New York	Washington
Indiana	North Carolina	West Virginia
Kansas	North Dakota	Wisconsin
Kentucky	Ohio	
Louisiana	Oklahoma	

Who is protected? Defining "agritourism"

Each state law provides a definition for "agritourism," or "agritourism activities" that clarifies who the law aims to safeguard from liability for visitor injuries. An agritourism operator will not receive the statute's benefits unless it meets the definitions. Common elements in the definitions of "agritourism" or "agritourism activity" include:

- The agritourism activity takes place on a "farm" or "ranch" that is "working," "commercial," or engaged in "agricultural production."
- The producer may or may not receive compensation for an agritourism activity.
- The agritourism activity is for educational, recreational or entertainment purposes, with some states also including historic or cultural purposes.
- A handful of states provide examples of agritourism such as educational programs, hospitality services, guided and self-guided tours, bed and breakfast accommodations, petting

> zoos, farm festivals, corn mazes, harvest-your-own operations, hayrides, barn parties, horseback riding, fee fishing and camping.

Missouri's Agritourism Promotion Act presents a typical example of a definition of an "agritourism activity:"

> (1) "Agritourism activity", any activity which allows members of the general public for recreational, entertainment, or educational purposes to view or enjoy rural activities, including but not limited to farming activities, ranching activities, or historic, cultural, or natural attractions. An activity may be an agritourism activity whether or not the participant pays to participate in the activity. An activity is not an agritourism activity if the participant is paid to participate in the activity.[2]

Louisiana takes a unique approach to defining agritourism activities. The State Commissioner of Agriculture and Forestry publishes an annual list of activities that the commissioner has defined as agritourism activities when the activities are conducted on an agricultural operation. The current list contains 32 types of activities.[3]

Immunity applies to "inherent risks" of agritourism

Most of the state laws extend immunity if a visitor's harm results from an "inherent risk" of an agritourism activity. The purpose of the "inherent risk" approach is to relieve an operator from liability for the naturally occurring risks of an activity over which an operator has little or no control. The laws are fairly consistent in presenting a list of "inherent risks" that addresses land surfaces, vegetation, animals, equipment, and the visitor's own behavior, as illustrated by Kansas's Agritourism Promotion Act:

> "Inherent risks…" means those dangers or conditions which are an integral part of such agritourism activity including, but not limited to, certain hazards such as surface and subsurface conditions; natural conditions of land, vegetation, and waters; the behavior of wild or domestic animals; and ordinary dangers of structures or equipment ordinarily used in farming or ranching operations. "Inherent risks of a registered agritourism activity" also includes the potential of a participant to act in a negligent manner that may contribute to injury to the participant or others, such as failing to follow instructions given by the registered agritourism operator or failing to exercise reasonable caution while engaging in the registered agritourism activity.[4]

Only a handful of states define "inherent risks" more broadly than Kansas. Florida's law applies to "any of the inherent risks of agritourism activities,"[5] Ohio includes "the possibility of contracting illness resulting from physical contact with animals, animal feed, animal waste, or surfaces contaminated by animal waste"[6] and Maine includes "the depositing of manure."[7]

Exceptions to immunity

Each agritourism immunity statute also lays out exceptions to its grant of immunity. If a visitor's harm arises from one of the exceptions, the agritourism operator loses the law's protection and could be liable for the harm. Types of exceptions vary from state-to-state. Most common are those found in the Oklahoma Agritourism Activities Liability Limitations Act:

> Nothing in [this law] prevents or limits the liability of an agritourism professional if the agritourism professional does any one or more of the following: 1. Commits an act or omission that constitutes negligence or willful or wanton disregard for the safety of the participant, and that act or omission proximately causes injury, damage, or death to the participant; 2. Has actual knowledge or reasonably should have known of a dangerous condition on the land, facilities, or equipment used in the activity or the dangerous propensity of a particular animal used in such activity and does not make the danger known to the participant, and the danger proximately causes injury, damage, or death to the participant.[8]

A number of states include additional exceptions to immunity. Alabama will not prevent liability if the agritourism operator "fails to properly train or improperly or inadequately trains an employee who is actively involved in the agritourism activity and an act or omission of the employee proximately causes injury, sickness, damage, or death of the participant"[9] or "fails to vaccinate, or quarantine sick domestic or domesticated animals in accordance with applicable animal health statutes and regulations."[10] In Washington, an agritourism provider is not protected by the statute if the provider "permits minor participants to use facilities or engage in agritourism activities that are not reasonably appropriate for their age."[11] Oregon will not grant immunity if an operator "provides equipment to the participant and fails to make reasonable inspection of the equipment, and that failure is a cause of the injury to the participant"[12] or "fails to make reasonable inspection of the property on which the agritourism activity occurs, and that failure is a cause of the injury to the participant."[13] Many states also remove immunity if the agritourism provider did meet the law's affirmative requirements, as explained below.

Affirmative requirements for the agritourism operator

A majority of the states establish affirmative actions the provider must take to qualify for immunity. An agritourism operator who fails to complete a state's affirmative requirements will lose the liability protection afforded by the immunity law. Most common is the requirement for operators to provide notices to agritourism visitors or include notices in agritourism contracts. In several states, agritourism operations must register or have an approved operation plan. We review these requirements below.

Requirements for notices on signs and in contracts

The 28 states listed below require operators to post and maintain warning signs that notify visitors of the agritourism immunity law's liability protection and/or the inherent risks of agritourism activities. A dozen states also direct agritourism operators to include the notice in written contracts or agreements. Most statutes provide the exact language the sign or contract must contain as well as specifications for the size of font and locations of signs, although the level of detail for the notice varies among the states.

Laws that require business to provide notices

	On posted signs	*In contracts*
Alabama	✓	
Arkansas	✓	✓*
Colorado	✓	
Florida	✓	✓
Georgia	✓	
Idaho	✓	✓
Indiana	✓	✓
Kansas	✓	✓
Kentucky	✓**	✓
Louisiana	✓	
Maine	✓**	
Minnesota	✓	
Mississippi	✓	✓
Missouri	✓	✓
Nebraska	✓	
New York	✓	
North Carolina	✓	✓
North Dakota	✓	✓
Ohio	✓	
Oklahoma	✓	✓
Oregon	✓	✓
South Carolina	✓	✓
Tennessee	✓	✓
Texas	✓	✓
Utah	✓	
Virginia	✓	
Washington	✓	✓
West Virginia	✓	✓
Wisconsin	✓	

* In contracts with agritourism participant only. Arkansas 2-11-107.
** May post a sign or obtain a signed release indicating that participant has received written notice. K.S.A. 247-809(a) and 7 M.R.S.A § 253.

Idaho provides an example of a simple notice requirement, which must state "WARNING Under Idaho law, there are risks associated with agritourism, which could lead to injury or death. You are assuming these risks. Section 6-3004, Idaho Code."[14] A more detailed notice requirement is in Wisconsin's statute, which states that a sign must contain the following notice in black lettering, each letter a minimum of one inch in height, on a white background:

> Notice: A person who observes or participates in an agricultural tourism activity on this property assumes the risks inherent in the agricultural tourism activity. Risks inherent in the agricultural tourism activity may include conditions on the land, the unpredictable behavior of farm animals, the ordinary dangers associated with equipment used in farming operations, and the potential that a participant in the agricultural tourism activity may act in a negligent way that may contribute to injury or death. The agricultural tourism provider is not liable for the injury or death of a person involved in an agricultural tourism activity resulting from those inherent risks.[15]

Requirements for registration and operation plans

As the first state to enact an agritourism immunity law, Kansas included a registration process for agritourism operations within its statute. While registration is permissive, only those agritourism locations that have registered can receive the law's liability protection. The Kansas statute provides the following:

> Any person who is engaged in the business of providing one or more agritourism activities may register with the secretary of wildlife, parks and tourism. The registration shall contain all of the following: (1) Information describing the agritourism activity which the person conducts or intends to conduct. (2) Information describing the location where the person conducts or intends to conduct such agritourism activity.[16]

Agritourism operators in Kansas that register also benefit from promotion and publicity by the State. Only a handful of states have followed the Kansas registration approach, as indicated in the chart below.

States with agritourism registration provisions
Georgia
Kansas
Louisiana
Mississippi
Missouri
North Dakota
Oklahoma

In addition to registration provisions, Louisiana's law includes a certification process that requires agritourism professionals to submit a plan of operation for agritourism activities if they seek to utilize the law's immunity provisions. Components of the plan include a listing of agritourism activities,

identification of activity risks and plans for minimizing the risks, and locations of warning signs. Applicants must submit the plan to the Louisiana Extension Service for approval and update the plan every five years or whenever adding a new activity.[17]

What about waivers?

A written waiver or release of liability form is the traditional tool for addressing liability for voluntary engagement in risk-based activities like those involved in agritourism. The waiver serves as the participant's recognition that he or she is assuming the risk of the activity. It contains a promise by the participant to release the activity provider from any liability if the participant suffers harm due to the provider's ordinary negligence or the inherent risks of the activity.

A state immunity law can negate the need for an agritourism business to require that customers sign a waiver before participating in an agritourism activity. If the state immunity law covers all of an agritourism business's risky activities then the business may not need to utilize written waivers. However, if the business offers additional activities that the immunity law might not include within its liability protections, the agritourism business might need to use a written waiver for those activities that might not be covered by the law. Note, too, that an insurance provider or attorney might encourage an agritourism client to utilize waivers as a risk management tool even if the state has an agritourism immunity law.

Several agritourism immunity laws specifically refer to the immunity law's relationship with waivers. Montana's Recreation Responsibility Act states that the law does not prohibit the use of a written waiver or release, requires that a waiver contain certain language, and allows that a waiver may still be challenged on legal grounds. [18] Texas, Kentucky and Maine grant liability protection to a provider who either posts a warning sign or obtains a signed written agreement stating that the participant received a warning of the inherent risks of an activity.[19]

Other laws that can provide agritourism immunity

In addition to immunity laws that specifically target agritourism businesses, other laws could address an agritourism liability situation. A farmer or rancher may be able to receive liability protection through these other types of immunity statutes, which can be especially important if the farmer or rancher's state does not have an agritourism immunity statute. In those situations, agritourism businesses should assess how other liability protection laws in the State might apply to its activities.

Recreational user immunity statutes

All fifty states have a recreational user statute that provides landowners with immunity from liability for harm that happens to people who are on the property for recreational purposes. States adopted these laws to encourage property owners to open up their lands to others for recreational activities. In

exchange for opening their lands, property owners are shielded from liability for injuries that recreational entrants incur while on the property. Recreational pursuits often include activities like hiking, fishing, swimming, camping, snowmobiling, and sometimes hunting; however, what qualifies will depend upon the language of a state's statute. Note, however, that many recreational user statutes do not allow a fee or consideration to be charged for the activity. With this limitation, an agritourism operation will only benefit from the statute if the person was injured while engaging in an agritourism activity that was free of charge.

Michigan's recreational user law provides an example of this type of law:

> Except as otherwise provided in this section, a cause of action shall not arise for injuries to a person who is on the land of another without paying to the owner, tenant, or lessee of the land a valuable consideration for the purpose of fishing, hunting, trapping, camping, hiking, sightseeing, motorcycling, snowmobiling, or any other outdoor recreational use or trail use, with or without permission, against the owner, tenant, or lessee of the land unless the injuries were caused by the gross negligence or willful and wanton misconduct of the owner, tenant, or lessee.[20]

Some states have added agritourism activities into a preexisting recreational user law rather than creating a separate agritourism immunity law. Alaska, for example, recently amended its recreational user immunity statute to include "farm touring" as an activity covered by the law. "Farm touring" means "briefly visiting a farm to observe or experience aspects of raising, growing, producing, cultivating, harvesting, or processing an agricultural product as a tourist, without receiving pay."[21] The law applies to all activities, including those conducted for a fee.

For more information on state recreational user statutes, see our compilation at http://nationalaglawcenter.org/state-compilations/recreational-use/.

"U-pick" immunity laws

"U-pick" immunity statutes offer liability protection in a few narrow circumstances. The laws, also known as "you-pick," "pick-your-own" and "you-pick-your-own" laws, generally apply only to people entering onto a farmer's land for the purpose of purchasing or picking fresh fruits and vegetables directly from the field. The immunity will protect the landowner from legal liability for any injuries to a customer that occurs while purchasing or picking from the land. Importantly for tenants and lessees, the immunities often apply to whoever is in possession and control of the land, not just the landowner.

Pennsylvania, for example, does not have an agritourism immunity law but does have a "u-pick" law that covers a range of activities, as follows:

> (a) No cause of action shall arise against the owner, tenant or lessee of land or premises for injuries to any person, other than an employee or contractor of the owner, tenant or lessee, who is on the land or premises for the purpose of picking and purchasing

> agricultural or farm products at a farm or "u-pick" operation, unless the person's injuries were caused by a condition which involved an unreasonable risk of harm and all of the following apply: (1) The owner, tenant or lessee knew or had reason to know of the condition or risk. (2) The owner, tenant or lessee failed to exercise reasonable care to make the condition safe or to warn the person of the condition or risk.
> (b) As used in this section, the term "agricultural or farm products" means the natural products of the farm, nursery, grove, orchard, vineyard, garden and apiary, including, but not limited to, trees and firewood.[22]

Many states have exceptions for when the landowner knew about a dangerous condition, failed to adequately warn a customer about the condition, and failed to adequately make the condition safe. Adequacy is tested by a reasonableness standard that looks at the facts of the situation to determine whether an action meets society's expectations of what a reasonable person in the same situation would do.

Equine immunity laws

For harm sustained while engaging in activities with horses and other equine, an agritourism operator in a state without an agritourism immunity law might be able to utilize the State's "equine activity" law. The State of Illinois illustrates how this type of law shifts the risk of harm from equine to the participant:

> Each participant who engages in an equine activity expressly assumes the risk of and legal responsibility for injury, loss, or damage to the participant or the participant's property that results from participating in an equine activity, except in specific situations as set forth in Section 20, when the equine activity sponsor or equine professional may be held responsible.[23]

As with the Illinois equine activity law, equine activity statutes often contain several exceptions or instances for which the provider will be liable. Exceptions often include providing faulty equipment or tack, failing to assess the participant's ability to engage in the equine activity, failing to warn of known dangerous conditions of the land, and willfully or intentionally injuring participants. Most of the laws also require the business to post a warning sign that notifies participants of the risks of being around equine and the immunity for harm provided by the law.

Refer to the Animal Legal & Historical Center for a compilation of state equine activity laws at https://www.animallaw.info/content/map-equine-activity-liability-statutes.

Using an agritourism immunity law

The existence of an agritourism immunity law doesn't automatically guarantee an agritourism business of liability protection for visitor injuries. In addition to meeting the definitions, eligibility requirements and affirmative actions that a statute may contain, an agritourism business must raise the immunity statute if an injury situation results in litigation. Many states have specific requirements for using the law's immunity protection. For example, Washington's statute states:

> In any action for damages against an agritourism professional for agritourism activity, the agritourism professional must plead the affirmative defense of assumption of the risk of agritourism activity by the participant.[24]

Utah's law directs the court to undergo a comparative negligence analysis to determine if the harmed person disregarded warnings or misused animals or equipment.[25] These laws illustrate the importance of properly using the agritourism immunity statute.

Agritourism and immunity laws: next steps for agritourism businesses

Learning about agritourism immunity laws in the United States is an important first step for farmers and ranchers pursuing or planning to operate an agritourism business. In the following checklist, we provide considerations to make when examining agritourism liability in a specific state. We also provide several additional resources on agritourism liability. Our hope is that utilizing the checklist and resources will enable farmers and ranchers to continue on a path toward optimal agritourism liability risk management.

See our other Factsheets in this series for more resources on legal issues in agritourism.

Agritourism and Immunity Laws: A Checklist for Agritourism Businesses

Agritourism operators may use this checklist as a tool to understand how a state's immunity laws impact the agritourism business. The checklist is not exclusive, but serves as a starting point in considering liability protection laws. We encourage an agritourism business to confer with its attorney and insurance provider for individual guidance on liability protection.

1. **Determine if your state has an agritourism immunity law.** Refer to our state compilation of laws at http://nationalaglawcenter.org/state-compilations/agritourism/. If your state does not have an agritourism immunity law, determine if there a recreational user statute, "U-pick" statute, or equine activity act that could apply to your situation.

2. **Review the law to understand how it applies to your agritourism situation.**

   → Who does the law protect from liability? Identify the eligibility requirements for the type of provider or activity that the law will protect, such as the purpose of the activity and whether the activity must be conducted on a commercial or working farm. You will not receive the law's protections if you or your agritourism activities do not meet these requirements.

   → What types of risks does the law apply to? Understand how the law defines "inherent risks" or the risks that receive liability protection. Determine if there are other risks in your agritourism activities that are not covered, such as the risk of contracting an illness from an animal, and take additional precautions for those risks, such as keeping customers away from animals.

   → What are the exceptions to immunity? Determine whether the law will not give liability protection for certain behaviors or situations, such as failing to properly train employees or failing to make a reasonable inspection of property or equipment. Take additional precautions to ensure that a situation on your business does not become an exception to immunity.

   → What affirmative requirements does the law contain? Does the law require you to post a warning sign, include warnings in your contracts, register with the State, develop an operating plan, or take any other steps? Comply with the requirements and document the actions you have taken for compliance.

3. **Consult with your professionals to confirm your understanding of the law and determine if you should still use a written waiver or release of liability**. Meet with your attorney and insurance provider to review all of the activities that you offer, how the immunity laws apply to your business, and the extent of your insurance coverage. Ask your professional team if you should also use written waivers to further protect you from liability.

Additional Resources

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[12] O.R.S. § 60.673(2)(d).
[13] O.R.S. § 60.673(2)(e).
[14] I.C. § 6-3005(2).
[15] W.S.A. 895.524(2)(a)(2).
[16] K.S.A. 32-1433(a).
[17] LSA R.S. 9:2795.5; LSA A.C. 7:XLV.105.
[18] MCA 27-1-753(3).
[19] V.T.C.A § 75a.004; KRS § 247-809(a); 7 M.R.S.A § 253(3).
[20] MCLS § 324.73301.
[21] AS § 09.65.290(e)(3).
[22] 42 P.S. § 8339.
[23] 745 I.L.C.S. 47/1.
[24] West's RCWA 4.24.832 (c).
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Factsheet Series: 2019

Farm Animals and People: Liability Issues for Agritourism

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Who can resist the appeal of a goat, a calf, or a baby pig? Farm animals can be a valuable attraction for an agritourism operation. But having people and animals on the farm creates liability risks. Whether feeding, riding, petting, observing, or just being near farm animals, visitors could be harmed and agritourism operators could be liable for that harm. Understanding farm animal liability risks and utilizing tools to reduce those risks can help reduce both the possibility of visitor injuries and legal liability for the agritourism operator.

Negligence and legal duties for property visitors

Laws in every state establish legal duties that require landowners to keep visitors safe from harm on the property. These legal duties arise from premises liability laws made by our courts and also from various state statutes. Premises liability laws require landowners to take reasonable actions to protect visitors from foreseeable risks that could harm them. Some states command an even higher legal duty if the visitor is a customer, and require a landowner to protect a customer from unknown dangers in addition to those risks that are foreseeable to the owner. Legal duties for landowners can also derive from state and local statutes and regulations that call for specific actions a property owner must take in certain circumstances.

Whether a legal duty derives from court-made law or specific statutes and regulations, a visitor who suffers harm because the property owner violated the legal duty may be able to allocate liability to the property owner. Negligence is the typical legal theory for doing so. A negligence cause of action would assert that a property owner failed to meet the mandated legal duty,

This material is based upon work supported by the National Agricultural Library, Agricultural Research Service, U.S. Department of Agriculture.

which caused the visitor's harm. If the visitor can prove that the landowner violated a legal duty that he or she had to the visitor and that the breach of that duty caused harm to the visitor, the landowner could be deemed negligent. A finding of negligence would make the landowner liable for the resulting harm suffered by the visitor.

Farm animals and premises liability law

Imagine the many foreseeable risks of allowing agritourism visitors to be around farm animals. A person could be stepped on, pushed over, thrown from, pinned, kicked, scratched, or bitten by an animal. Another increasingly common way a visitor can be injured is by getting an infection from an animal, referred to as zoonotic disease transmission. These dangers and risks to visitors posed by farm animals translate into legal duties for agritourism operators. According to premises liability law, an operator has the legal duty to take reasonable actions to protect visitors from the risks of being around farm animals. Reasonable actions can include removing or repairing dangerous conditions, keeping visitors away from them, or warning visitors of the dangers. If a visitor is harmed because an operator failed to take such actions, the operator could be subject to liability through a negligence claim.

Farm animals and statutory laws

An agritourism operator could also be negligent if his or her failure to meet a legal duty assigned in a statute or regulation caused harm to a property visitor. A variety of laws and regulations can relate to protecting people from the dangers of farm animals. The laws vary from state-to-state, so it's important to identify the precise laws that apply in a particular state. Two types of laws are most common: livestock containment laws and sanitation laws.

Livestock containment statutes

All but a handful of states have laws that require owners of livestock to contain or "fence in" their livestock. If an animal escapes its enclosure and causes harm to visitors or others' property, an owner could be liable for the harm. Most of these state laws don't create automatic liability for the livestock owner but instead require a harmed party to prove that the owner negligently breached the legal duty to contain livestock, such as by leaving gates open or failing to maintain good fences or stalls.

In the agritourism setting, livestock containment laws establish a statutory legal duty for operators to properly contain their animals. This duty could include using best management practices to build fences, gates, stalls and doors that are capable of containing livestock. Some state or local laws might also mandate particular types of enclosures or fences, such as requiring that fences be constructed according to Natural Resources Conservation Service Conservation Practice Standard Code 382. In addition to proper construction, an operator's legal duty would include inspection and maintenance of enclosures and regular monitoring to ensure that animals are in their enclosures.

Hand sanitation statutes

State hand sanitation laws establish hand washing facilities and education in order to prevent zoonotic disease transmission, a growing liability risk for agritourism operations. Zoonotic diseases occur when humans pick up animal germs by touching animals or surfaces contaminated by animals then transferring the germs to their mouths.[1] This accidental ingestion of animal germs can cause infections and diseases that may lead to illness or death, such as an e-coli infection from animal manure that led to permanent dialysis for a young child in Minnesota and a $7.5 million judgment against the agritourism operation that hosted the child.[2]

Despite the high danger of zoonotic disease transmission from human-animal interactions, only seven states have hand sanitation laws that could reduce this risk. Of those, only the laws of New Jersey, New York, Pennsylvania and Washington could apply to agritourism operators, as the other laws apply only to fairs and public shows or exhibitions.[3] While the sanitation laws vary from state-to-state, they generally address the placement of hand washing stations near animal contact exhibits. Some also require the operator to provide education for visitors about zoonotic disease transmission and how to properly wash hands and avoid contact with animal germs. Such requirements create statutory legal duties for agritourism operators, and an operator could be liable for harm to a visitor who contracts a zoonotic disease because the operator did not fulfill his or her legal duty to provide the required sanitation station or educational information.

<u>Management practices and legal duties</u>

There are many management practices that can help an agritourism operator meet his or her legal duties to keep visitors safe from farm animal dangers. Common sense suggests many of these practices, but it is also wise to refer to experts for recommended "best management practices" and industry standards. Don't forget that state laws could also require an operator to follow certain practices. Following the steps below to identify and implement management practices can reduce the risk of a farm animal liability incident.

1. Assess the types of animal-human interactions that occur on the operation and the potential dangers visitors face from being near farm animals.
2. Identify required and recommended management practices that address each type of animal-human interaction or potential danger. See the chart below, and refer to specific laws and academic and industry experts in agritourism, farm animals, and farm safety.
3. Include emergency response planning that addresses what to do if there is an accident or emergency involving farm animals and people.
4. Develop and document standard operating procedures that implement the required and recommended practices.
5. Train all employees on how to correctly follow the standard operating procedures.
6. Continuously assess the property to ensure that practices are in place.

7. Maintain records of standard operating procedures, employee training protocols, and any actions taken to implement management practices. Records can include written materials as well as photographs and videos.

The following chart provides examples of management practices that address farm animal-human interactions. This is not a complete list. To finalize a list for a particular agritourism operation, refer to specific state laws and additional resources from experts such as those listed at the end of this publication.

Examples of Management Practices for Farm Animal-Human Interactions

Farm animal danger	*Examples of practices to keep visitors safe*
Being stepped on, pushed over, pinned, kicked, scratched or bitten by an animal.	• Construct and maintain fences that are capable of containing the specific types of animals. • Place barriers between visitors and animals and utilize locking mechanisms on doors and gates. • Allow animal contact only through barriers. • Regularly inspect all animals, fences, enclosures and gates. • Supervise all animal-human interactions. • Remove animals that have a history of negative interactions with people.
Falling off or being thrown from an animal, or falling off equipment pulled by or attached to an animal.	• Provide proper instruction on handling or riding an animal. • Match inexperienced or young visitors with animals that have a history of good behavior and interactions with people. • Regularly inspect and maintain equipment. • Train employees to follow standard operating procedures and best management practices.
Ingesting germs from direct animal contact.	• Select lower risk animals for direct contact such as rabbits, pigs and horses. • Prevent human contact with higher risk animals such as poultry, pre-weaned calves and young lambs or goats. • Provide hand washing stations with running water, soap, and towels (required by state sanitation laws in some states). • Provide instructions on how to wash hands properly (required by state sanitation laws in some states).
Ingesting germs from contaminated surfaces, objects or foods.	• Continuously manage manure and prevent human contact with manure areas. • Regularly inspect and disinfect surfaces in animal areas that visitors might touch, such as railings and barriers. • Provide a transition area between animal areas and non-animal areas and do not allow toys, baby bottles, strollers, food, beverages or similar items beyond the transitional area. • Place food service or eating areas far from animal areas. • Provide handwashing stations and instructions in food areas, as stated above.

Immunity statutes can protect operators

An immunity law can change the outcome of a negligence claim against an agritourism operator. An immunity law removes the operator's legal duty to keep visitors safe in certain situations that carry inherent risks. Immunity laws assume that a person knows that certain activities have inherent risks that a landowner can't completely control. If a visitor voluntarily engages in an inherently risky activity and suffers harm, the immunity law shifts responsibility for that harm to the injured person rather than the landowner.

Because agritourism activities carry many inherent risks, a number of states have enacted "agritourism immunity laws" to protect agritourism operators from liability for certain risks. One common provision in these laws is to identify "the behavior of domestic and wild animals" as an inherent risk of being on an agritourism farm. This type of provision could prevent an operator from being liable if an animal steps on, bites, or otherwise behaves in a way that causes harm to a visitor. Note, however, that only a few of the agritourism immunity laws might address the transmission of farm animal diseases. Only Ohio's law specifically mentions illnesses from animals,[4] while Maine's law includes harm from "the depositing of manure,"[5] and Florida protects an operator from "any of the inherent risks of agritourism,"[6] which might address farm animal diseases.

"Equine activity laws" might also provide immunity for agritourism farms that have horses, donkeys, and similar equine. These laws shift the risk of being harmed by an equine's unpredictable behavior to the participant in an equine activity, but don't protect operators who provide faulty equipment or tack or fail to assess a participant's ability to engage in the equine activity. "Recreational user statutes" might also protect agritourism operators from harm to visitors who engage in certain recreational activities on the farm. Be aware that many recreational user statutes apply only if the landowner does not receive a fee or benefit for the activity, so a state's law might not extend to a commercial agritourism operation.

For each of these different types of immunity laws, an operator must meet the requirements of the law in order to receive the immunity. For example, most agritourism laws require the operator to post a warning sign that notifies visitors of inherent risks of agritourism activities and that the law protects the operator from liability. Failing to meet an immunity law's requirements can disqualify an operator from immunity.

It's very important for an agritourism operator to know which immunity laws apply to the operator and to understand the requirements of each applicable law. For more information on immunity laws, refer to our Fact Sheet on "Agritourism Immunity Laws in the United States," available on the National Agricultural Law Center website at http://nationalaglawcenter.org/.

What about waivers?

A written waiver or release of liability form is the traditional tool for addressing liability for voluntary engagement in risk-based activities like those involved in being around farm animals. The waiver serves as the participant's recognition that he or she is assuming the risk of the activity. It contains a promise by the participant to release the activity provider from any liability if the participant suffers harm due to the provider's ordinary negligence or the inherent risks of the activity.

The types of immunity laws described above can negate the need for an agritourism operator to require that customers sign a waiver before participating in an agritourism activity. If the state immunity law covers all farm animal risks then the business may not need to utilize written waivers. However, if the operation offers additional activities that the immunity law might not include within its liability protections, the agritourism business might need to use a written waiver for those activities that might not be covered by the law. Also, an insurance provider or attorney might encourage an agritourism client to utilize waivers as a risk management tool even if the state has an agritourism immunity law. Note, however, that state laws can have very specific requirements for waivers and a court might not enforce a waiver that does not meet the legal requirements. For this reason, an agritourism operator who wants to utilize waivers should consult with an attorney to determine whether a waiver is applicable to the situation and should have the attorney draft the instrument.

Insurance: an important tool for managing risk

Insurance is a valuable tool for addressing the potential that an agritourism operator will be liable for harm to a visitor. An agritourism operator who offers agritourism activities, whether or not for pay, should have adequate insurance to address all agritourism activities conducted on the operation. Because many farm general liability policies don't include agritourism activities, however, an agritourism operator may have to obtain a customized rider that adds or amends liability coverage above and beyond a farm or ranch's general policy. It is important to review all farm animal activities to ensure that the policy covers each one. If coverage is not available or is very costly, an agritourism operator might want to reconsider whether to offer the farm animal activity. For more information on agritourism insurance, refer to our Fact Sheet on "Agritourism and Insurance," available on the National Agricultural Law Center website at http://nationalaglawcenter.org/.

Reduce the risk of farm animal liability

The following checklist provides a summary of important steps to follow in order to reduce the risk of liability for harm caused by farm animals on the agritourism operation. Be sure to confer with an attorney and insurance provider for individual guidance on liability protection.

Reducing Liability for Farm Animals and People: A Checklist

Agritourism operators may use this checklist as a starting point to help ensure careful consideration of the liability issues that arise from farm animal-human interactions, and should also confer with an attorney and insurance provider for individual guidance on liability protection.

1. **Identify your legal duties for protecting visitors from farm animals.** Identifying your legal duties requires that you understand:
   - → Your state's premises liability laws, which defines the legal duties you have for different types of visitors on your operation.
   - → Additional state or local laws that specifically address farm animals, such as livestock containment laws and sanitation statutes.

2. **Implement management practices that address your legal duties.** Refer to our chart above and other resources from experts in agritourism, farm animals, and farm safety to identify required and recommended management practices for your operation.
   - → Develop standard operating procedures to implement the identified practices.
   - → Include emergency response plans that lay out procedures to follow in case there is an accident from animal-human interaction.
   - → Train all employees on your management practices and response plan and how to correctly follow standard operating procedures.
   - → Maintain records of your standard operating procedures, employee training protocols, response planning, and other actions taken to implement best management practices.

3. **Utilize applicable immunity laws in your state and determine whether you should also utilize waivers.** Identify the immunity laws that apply to your farm animal activities and understand how to qualify for and utilize the laws, and consult with an attorney to determine if you should use waivers and if necessary, to draft your waivers.

4. **Assess liability insurance needs.** Review your farm animal activities with your insurance provider and ensure adequate liability insurance coverage for each activity.

5. **Regularly review, inspect and assess your farm animal activities.**
   - → Conduct regular inspections of the property to ensure that you are properly addressing your legal duties for farm animal situations.
   - → Stay up-to-date on best practices for managing animal-human interactions.
   - → Before adding new activities involving farm animals on your operation, conduct a risk analysis by assessing your legal duties, required management practices and insurance coverage options. If the risk of liability is too high, reconsider whether to offer the new activity.

References and Resources

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See our other Factsheets in this series for more resources on legal issues in agritourism.

Factsheet Series: 2019

Food Sales at Agritourism Operations: Legal Issues

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This material is based upon work supported by the National Agricultural Library, Agricultural Research Service, U.S. Department of Agriculture.

Thinking about selling food at your agritourism operation? Offering food products is a good way to attract people to the farm and increase business revenues, but selling food also raises legal issues. Whether you want to sell fresh produce, cottage foods or baked goods, or prepare and serve food on-site, there are legal risks and requirements that may come into play. Consider these important questions about food sales:

- Do zoning laws allow you to conduct food sales?
- What food safety laws apply to your foods?
- Do you need a food sales license?
- What if someone gets sick from your food product?
- Must you collect sales tax on the food items?

The answers to these questions depend upon your state and local laws. The following information should help you start to find the answers to your questions, but be sure to locate the specific laws in your state and locality and seek legal guidance from an attorney in your state.

Zoning laws

Does the law allow you to conduct food sales on your property? If your community is zoned, your zoning laws should address whether selling food at your property is a permissible activity. Typically, a zoning resolution or ordinance for a community designates different zoning "districts" and determines the "permissible uses" or "conditional uses" that may occur on land parcels within each zoning district. Different types of food sales can fall under different types of uses. For example, produce sales on a farm might be a "farm market" or "grocery" use, while preparing

individual food items on the farm might be designated as a "restaurant" or "food service" use. Some zoning resolutions also treat "agritourism" as a type of land use and define permissible activities within the definition of agritourism. The classifications and definitions will vary from state to state and community to community.

Check your local zoning resolution to identify what zoning district your land is in and review the provisions for permitted uses, making sure that you understand how the zoning resolution defines your proposed food sales activity. Your food activity might fall in the "conditional use" category. This means that you must seek approval of the activity by the local board of zoning officials and the board may place conditions upon your activity if approved. An activity that is not a permitted or conditional use is a prohibited use for the zoning district. Typically, a request to rezone the property as a different type of zoning district is the only remedy for converting a prohibited use into a permitted use.

Note that some states have state laws that could affect whether food sales are permissible. For example, Ohio's "agricultural exemption" from local zoning includes "agritourism" activities. The law prevents local governments from enacting zoning regulations that prohibit agritourism activities.[1] Because of the uniqueness and complexity of zoning laws, it can be very helpful to talk with your local zoning officer or a land use attorney to fully understand how zoning law affects your property. For more information about agritourism and zoning, see our other fact sheet in this series on "Agritourism Activities and Zoning."

Food safety and licensing laws

Are there food safety standards you must follow? Do you need a license for your proposed food sales activity? Food safety and licensing laws go hand in hand in aiming to ensure safe handling of food and reduce risks of contamination incidents. The specific standards and licensing requirements that apply to your situation will depend upon the type of food you'll be selling and your role in preparing the food for sale. Obtaining a license usually involves submitting an application and passing an inspection that verifies your compliance with food safety regulations. State laws vary, but here are examples of foods that may require you to obtain a license and comply with food safety standards:

- Foods prepared and served on-site in individual servings, such as sandwiches, hot dogs, pizza, soups, and full meals.
- Potentially hazardous foods processed on site and packaged for sale, such as salsas, pickles, cheesecakes and other foods that are acidified or require temperature control.
- Eggs, meats and dairy items, but note that many states exempt eggs and certain meats from licensing requirements if the items are raised and processed on the farm where sold.

Some food sales situations don't require a license or compliance with food safety standards, or may be subject to minimal requirements. Examples of these include:

- "Cottage foods" prepared in a residential kitchen, which typically includes jams, jellies, baked goods and other non-potentially hazardous foods that don't require temperature control. State "cottage food" laws vary tremendously by state, so be sure to understand your state law. View the National Agricultural Law Center's compilation of state cottage food laws at https://nationalaglawcenter.org/state-compilations/.
- Mobile units and "food trucks" owned and operated by another party. Typically, the party that owns the mobile unit is the party that is subject to licensing and food safety requirements.
- Fresh, unprocessed produce direct from the farm, but note that you may be subject to the Produce Safety Rule of the Food Safety Modernization Act, which establishes production practices for growing and handling the produce. Smaller produce growers can be exempt from this rule. A tool to help determine if you are exempt from the rule is available at https://www.fda.gov/downloads/Food/GuidanceRegulation/FSMA/UCM472499.pdf.

As with zoning, food licensing and food safety requirements vary by state and can be complex. Take care to obtain and understand the laws that apply in your state and locality. Legal assistance can be critical to ensuring compliance.

Product liability laws

If someone gets sick from food served at your agritourism operation, will you be liable? Food product liability is a serious concern for those who produce or sell food. One in six people every year experience a food borne illness, with 128,000 needing hospitalization and 3,000 dying from the illness.[2] Many factors would determine a liability outcome, but it's possible that an agritourism operation could be liable for selling food that causes illness or death.

All states have product liability laws that address liability for harm caused by "products," which encompasses food products. Generally, a producer or seller of a food product can be liable if someone is harmed because the product is "defective." A food product that is contaminated or unsafe could be deemed "defective." If the harmed party can prove that the food was contaminated, such as by carrying a virus or bacteria like E. Coli, Listeria, Norovirus or Salmonella, both the party that manufactured the food and the party selling the food can be liable for the harm the food caused.

There are many ways to reduce the risk of food product liability, however. The main causes of foodborne diseases are improper storage and preparation of food and food ingredients, cross-contamination, and improper hygiene by food handlers.[3] Proper handling and storage is critical to food safety success, and compliance with food safety regulations can ensure that you're reducing your risks of improper handling and storage. Carefully and constantly train employees to know and carry out proper handling practices. States and industries offer many food safety training programs, some required

and some voluntary. Cleanliness of food areas is also important, and implementing a regular "deep cleaning" schedule can be a strong risk management practice.

Agritourism operations with farm animals also face the risk that of transmitting diseases from animals to humans, referred to as "zoonotic disease transmission." Food consumption at the agritourism operation is one way to transmit zoonotic disease transmission. To reduce this risk, keep food areas as far as possible away from animal areas, prohibit food consumption in animal areas, and provide handwashing stations at the exits from animal areas. For more information on zoonotic diseases, see our other fact sheet in this series, "Farm Animals and People: Liability Issues for Agritourism."

Product liability insurance is a necessary tool for addressing product liability risk. Agritourism operations should review their food operations with insurance carriers and ensure that all food activities have sufficient insurance coverage.

Sales tax laws

M*ust you collect sales tax on food items you sell?* The answer to this question is entirely dependent upon state and local tax laws. Nearly all states that have a sales tax also have unique laws for food sales. These laws can vary based upon the type of food item and where the purchaser consumes the food. For example, many states exempt products of the farm sold by the farmer who raised them from sales tax.[4] Thirty seven states exempt most "grocery sales," or food purchased for home consumption, from the state sales tax.[5] Some laws exempt the sale of food for consumption off the premises where sold from sales tax but require sales tax collection on food consumed on the premises of the seller.[6] Certain candies, beverages or heated foods might not fall under the sales tax exemption for food[7] and a local government may have a different requirement for food sales than the state law.[8]

The variations and complexities in state and local sales tax laws for food highlight the importance of obtaining sound tax advice. Before engaging in food sales, understand which food items are subject to sales tax. If the operation will be selling foods that require the collection of sales tax, you'll need to follow state and local provisions for establishing a sales tax accounting, reporting and payment system. The state and local agencies that oversee taxation typically offer useful resources and guidance on sales taxes, and accountants and similar professionals can be helpful in ensuring sales tax compliance.

Pulling it all together

If you've read this publication then you've taken an important step toward addressing the legal issues that come with selling food at an agritourism operation. The following checklist may help you pull it all together and continue through your next steps. As you move forward, be sure to meet with your attorney, insurance provider and accountant to confirm your understanding of the laws and legal issues and review your legal compliance and risk management plans for your food sales endeavors.

Food Sales at Agritourism Operations: A Checklist for Agritourism Businesses

This checklist is not exclusive, but serves as a starting point for organizing and considering the legal issues that food sales raise for agritourism operations.

1. **Understand how zoning laws affect your food sales.**
   - → If you are in a state that has zoning exemptions or exceptions that apply to agriculture or agritourism, locate the law and ensure that your proposed activity falls under its provisions.
   - → If you are in an area that is subject to zoning but is not covered by an exemption from zoning, locate your local zoning resolution and identify your zoning district. Determine if your type of food sales is a "permitted" or "permissible" or other type of use that is allowed to take place in your district, a "conditional use" that requires approval of the activity by the local board of zoning officials, or a prohibited use that could only occur through a rezoning of the property or a similar special action.
   - → Talk with your local zoning officials to fully understand how your state and local zoning laws and exemptions affect your proposed food sales activities.

2. **Understand how food safety and food licensing laws affect your food sales.**
   - → If the food items you want to sell are "cottage foods" such as baked goods, jams and other non-potentially hazardous foods, determine how your state cottage food law affects you. Find your state cottage food law at https://nationalaglawcenter.org/state-compilations/.
   - → If your foods are not subject to a cottage food law, determine whether you must obtain a food sales license from your local or state agency in order to sell the food items.
   - → If you are growing the produce you are selling, determine whether you are subject to or exempt from the Food Safety Modernization Act. Refer to this information from the FDA: https://www.fda.gov/downloads/Food/GuidanceRegulation/FSMA/UCM472499.pdf
   - → Identify the food safety regulations and practices required for preparing and selling your food, and generate a plan for implementing the practices.

3. **Understand how product liability laws affect your food sales**
   - → Locate and review information about your state product liability laws and food sales.
   - → Train employees to know and carry out proper food handling practices.
   - → Develop a regular cleaning and "deep cleaning" schedule for your food areas.
   - → If you also have farm animals, develop a plan to keep food areas away from animal areas, prohibit food consumption in animal areas, and provide handwashing stations.
   - → Review product liability options with your insurance provider and obtain adequate insurance coverage for your food sales activities.

4. **Understand how sales tax laws affect your food sales.**
   - → Determine whether you must collect state and local sales tax for the types of foods you want to sell in the location you'll be selling the foods.
   - → Refer to your local and state taxing agencies for information and explanations of the laws and the exemptions that apply to different types of food and to foods raised by the seller.

5. **Consult with your professionals to confirm your understanding and plans for moving forward**.

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See our other Factsheets in this series for more resources on legal issues in agritourism.

Agritourism Activities and Zoning

Examples from around the country

Factsheet Series: 2019

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The National Agricultural Law Center is the nation's leading source for timely, authoritative and objective agricultural and food law research and information.

This material is based upon work supported by the National Agricultural Library, Agricultural Research Service, U.S. Department of Agriculture.

From corn mazes to wedding barns, entertaining people on the farm with "agritourism" activities is an increasingly popular business opportunity for farmers and ranchers. But agritourism activities tend to look different from traditional agricultural production activities, raising questions about whether and how to regulate agritourism activities through zoning. For this reason, agritourism businesses can encounter obstacles with zoning, as evidenced by two surveys in which 13% and 50% of the agritourism operators reported difficulties with zoning.[1] Some state and local governments have responded to these challenges by enacting zoning laws and regulations that specifically address agritourism. We highlight several examples from around the country below, which offer different approaches to resolving the challenges presented by agritourism and zoning.

Zoning and agricultural land uses

The zoning power allows a local government to regulate land uses within its territory and set standards for the development of land parcels. Zoning typically establishes separate zoning districts for residential, commercial, industrial, and agricultural uses. Of these district designations, the purposes of agricultural districts can be the most varied. Purposes may range from protection of agriculture and agricultural soils, to reducing the impacts of agricultural activities on other properties, to serving as a "catch all" for land uses that would not fit in any other district.[2]

Some states preempt a local government's ability to use zoning to completely prohibit agricultural activities, while others allow a

local government to regulate which types of agricultural land uses can exist in a zoning district. For either approach, the purpose of the zoning district and the definition of "agriculture" are important. Whether a district aims to protect or contain agricultural land uses, if and how a zoning law defines agriculture, and whether a zoning regulation distinguishes between different types of agricultural activities play critical roles in determining the impact of zoning on the existence and location of "agriculture."

How does "agritourism" relate to "agriculture"?

From a zoning perspective, the challenge with agritourism is defining whether and how it fits into state laws and local zoning regulations for agriculture. Is agritourism agriculture? Is it tourism? Is it a commercial activity? Does it have characteristics of more than one definition or zoning district? Does the locality want to encourage or discourage agricultural diversification and agritourism development? These uncertainties, combined with the growth of the agritourism industry, have led many state and local governments to and clarify how their zoning laws apply to agritourism with specific definitions, exemptions and conditions for agritourism land uses. We provide examples of four different approaches below: exempting agritourism land uses from zoning regulation, using an overlay district to address agritourism activities, establishing agricultural tourism zones, and addressing agricultural rentals halls as separate land uses.

Examples from the states

Ohio: The Agritourism Zoning Exemption

Ohio law confers zoning authority on its counties and townships, but at the same time strictly limits these jurisdictions from prohibiting the use of land for agriculture or requiring zoning certificates for buildings incident to the agricultural purpose of the land on which they are located.[3] This legal protection also extends to "farm markets,"[4] buildings used primarily for vinting and selling wine,[5] and as of 2016, to "agritourism."[6] Three statutory definitions clarify the types of land uses that qualify for the agritourism exemption. The activity must fit within the definition of "agritourism" and must take place on a "farm" that is devoted to "agricultural production," as follows:

> *"Agritourism"* is "an agriculturally related educational, entertainment, historical, cultural, or recreational activity, including you-pick operations or farm markets, conducted on a farm that allows or invites members of the general public to observe, participate in. or enjoy that activity."[7]
>
> A *"farm"* is "land that is composed of tracts, lots, or parcels totaling not less than ten acres devoted to agricultural production or totaling less than ten acres devoted to agricultural production if the land produces an average yearly gross income of at least twenty-five hundred dollars from agricultural production.[8]
>
> *"Agricultural production"* means "commercial aquaculture, algaculture meaning the farming of algae, apiculture, animal husbandry, or poultry husbandry; the production for a commercial

> purpose of timber, field crops, tobacco, fruits, vegetables, nursery stock, ornamental shrubs, ornamental trees, flowers, or sod; the growth of timber for a noncommercial purpose if the land on which the timber is grown is contiguous to or part of a parcel of land under common ownership that is otherwise devoted exclusively to agricultural use; or any combination of such husbandry, production, or growth; and includes the processing, drying, storage, and marketing of agricultural products when those activities are conducted in conjunction with such husbandry, production, or growth."[9]

While local zoning regulations can't prohibit agritourism activities that meet the definition of agritourism, Ohio law does allow limited zoning authority over several factors related to agritourism land uses. When necessary to promote the public health and safety, counties and townships may impose zoning requirements on agritourism operations for:

- Size of structures used primarily for agritourism
- Size of parking areas, but this does not include the power to require improvements like paving
- Setback building lines for structures used primarily for agritourism
- Egress or ingress[10]

Cass County, Nebraska: Agritourism Overlay Districts

The zoning code issued by Cass County, Nebraska creates an overlay district for agritourism that may apply to lands zoned as Agriculture, Transitional Agriculture, or Recreational/Agriculture.[11] An overlay district is not a separate district, but rather one that adds specific pre-determined requirements to a zoning designation that still applies to the land. For example, while a use might be a conditional use in the underlying zone that would require a normal zoning review and permit, if the requirements are met for the overlay district, the use could be a permitted use that would not require as lengthy of a review.

The stated intent of the agritourism overlay district captures the challenges and opportunities presented by agritourism and provides strong guidance for other communities dealing with agritourism and zoning:

> INTENT: Cass County Agritourism implementation states that to be successful depends upon the quality of the natural and built environments. Cass County's distinct character and quality resources provide the foundation for developing appropriate types of authentic tourism products that would ensure the county remains a unique and competitive destination in the future. Therefore, any tourism venture or experience which would be permitted in the agriculture and rural areas of the county must be directly related to the supporting primary agricultural use of the farm by interpreting the agricultural heritage of the county and providing a distinctly Cass County experience. This overlay district is intended for the Agriculture, Trans Agriculture and Rec/Agriculture Districts. Based on that foundation, certain types of uses are more appropriate than others in an agricultural or related zoning district because of the direct nexus to experiencing Cass County's agricultural heritage. Other uses that do not meet this basic threshold

> or are not incidental to the primary agricultural use should not be permitted uses. In other words, in the agritourism related uses identified below, the visitor to the attraction, event or experience must leave the enterprise with a better understanding and appreciation of Cass County agricultural heritage, processes and culture. Benefits include: 1. Enhancing the economic viability of the farm and providing onsite employment opportunities. 2. Generating additional income or off season income 3. Interacting and educating locals and visitors about the importance of farming in Cass County 4. Increasing awareness of local agricultural products 5. Developing a new consumer market niche.[12]

In Cass County, the overlay district creates an expedited permitting process whereby an agritourism operator with land in one of the required zones may apply for "over the counter" permits. The resolution states that "agritourism as it is most broadly defined involves any agriculture based operation or activity that brings visitors to a farm, ranch or acreage." The zoning code distinguishes between "minor over the counter permits" and "major over the counter permits" for agritourism. Minor permits involve a "walk-in, first come first served, case-by case" review "without the necessity of public notice or public hearing."[13] Major permits require a conditional use permit obtained through a notice and hearing procedure.[14]

Minor over the counter permits are available for agritourism activities such as camping sites, farmers markets, pumpkin patches, vineyards, Christmas tree farms, corn mazes, and other activities that are traditional agritourism activities or involve little food processing. Their inclusion in the overlay district provides these activities with a reduced burden to obtaining a permit, but still allows a local official to ensure that the activity is being conducted in a safe manner. [15]

Major over the counter permits still require a conditional use permitting process with a notice and hearing procedure. Activities in this category include bed and breakfasts, food manufacturing and sale, candle making and sale, small animal husbandry operations, antique dealers, wineries, and "other." Most of these activities would require a conditional use permit even without the overlay district. Specifying them in the overlay districts provides clarity that these activities are not eligible for the expedited process for minor over the counter permits. [16]

Forsyth County, North Carolina: Agricultural Tourism Zones

Rather than use an overlay district, Forsyth County and the City of Winston-Salem, North Carolina allows landowners to apply as an independent Agricultural Tourism Zone. An independent zone means that a property owner would have to seek a zoning change, which generally requires a notice and hearing process. One benefit of an independent zone includes the clarity of having one streamlined set of rules as opposed to having to reconcile an underlying zone with an overlay district. However, the process to change the zone could be more intensive than a minor permitting process allowed through an overlay district.

Forsyth County's Agricultural Tourism Zone does not apply to land uses defined as "agritourism" by the State of North Carolina's agritourism immunity law,[17] but does include such other land uses that fit within the zoning resolution's definition of "agricultural tourism," which means:

> "Any recreational, educational, entertainment, or limited business activity operated in association with and located on the same zoning lot as a Voluntary Agricultural District. Agricultural Tourism includes, but is not limited to the following uses: restaurant (without drive through service), retail store, weddings, bed and breakfast."[18]

The resolution limits Agricultural Tourism Zones to lots over 20 acres that are designated as a "Voluntary Agricultural District" through a separate program administered by Forsyth County.[19] The Agricultural Tourism Zone establishes standards for building setbacks, maximum seating capacities and floor areas in buildings, parking areas, and outdoor special events. [20] The resolution does not apply landscape and streetyard requirements for Agricultural Tourism Zones,[21] but does require building code compliance.[22]

Tippecanoe County, Indiana: Agricultural Rental Halls

The popularity of on-farm weddings has created perhaps the most difficult quandary for agritourism operators and zoning officials: navigating the different concerns of barns used for events versus barns used for agricultural production. Some jurisdictions have chosen to address "wedding barns" separately as a specific land use, as Tippecanoe County, Indiana did in 2013. Its zoning code defines an "agricultural rental hall" as:

> "An establishment (either with or without an outdoor component) where private parties, weddings, and/or receptions limited to attendance by invitation or reservation are held. Additionally, hosting public events, open to the public without the requirement of an invitation or reservation, at which entertainment is provided as the main attraction, may also be part of such business. […]"[23]

The ordinance allows agricultural rental halls as a "use permitted by right" in General Business Zones, and as a "use permitted by special exception" requiring Board of Zoning Appeals approval in two agricultural districts: Agricultural Zones and Agricultural and Wooded Zones.[24] In a General Business Zone agricultural rental halls may serve food made on the premises but only food prepared by an off-premises caterer may be served in the two agricultural zoning districts.[25] Additionally, agricultural rental halls in the agricultural districts may host no more than four public events per calendar year.[26] The ordinance also contains provisions for the size of parking areas, and in the rural zones requires grass or gravel overflow parking of sufficient size to accommodate all vehicles.[27]

The county's zoning code does not otherwise regulate agritourism activities. Without special designations, other agritourism activities would require a normal permit if such activities do not fall under the permitted use lists of the applicable zone for the agritourism operation.

Agritourism and zoning: insights

The above examples generate several insights that may be helpful to agritourism operations and local governments seeking solutions for addressing agritourism as a land use. An important first step is to assess the different types of activities that "agritourism" could bring to the community. Does the existing agricultural zoning district address these uses, or is there need for additional zoning provisions that clarify how agritourism activities fit within the zoning resolution? If changes are necessary, consider the following:

- If the goal is little or no zoning oversight over agritourism activities, an agricultural exemption could be an appropriate solution.
- An "umbrella" approach would encompass all agritourism activities that fit within a definition of agritourism, such as in Ohio's example. Conversely, a categorization approach could address agritourism land uses separately based on type or intensity of use, such as in Cass County's overlay district and Tippecanoe County's "agricultural rental hall" use classification.
- If differentiating between agritourism land uses, consider whether the zoning approval procedures should also vary, such as in Cass County's major/minor permits approach.
- Our examples suggest that parking areas, building sizes, and setbacks from property lines are common concerns raised by agritourism land uses.
- Tippecanoe's "agricultural rental hall" designation encourages higher intensity wedding/event facilities to locate in general business zones while reserving the agricultural zones for lesser intensity wedding/event facilities.

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[12] *Id*.

[13] *Id*. § 3.02.

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See our other Factsheets in this series for more resources on legal issues in agritourism.

Agritourism and Insurance

Insurance considerations for agritourism operators

Factsheet Series: 2019

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The National Agricultural Law Center is the nation's leading source for timely, authoritative and objective agricultural and food law research and information.

This material is based upon work supported by the National Agricultural Library, Agricultural Research Service, U.S. Department of Agriculture.

Offering agritourism activities is a fun way to teach people about agriculture or to increase a farm or ranch's income. But agritourism exposes an operator to different and additional types of liability risk. Because of this risk, a farmer or rancher must carefully consider insurance needs and ensure adequate insurance coverage.

What is agritourism insurance?

Farmers and ranchers obtain property liability insurance to cover the costs of a legal liability incident if someone is harmed on the property. Agritourism insurance refers to a customized rider that adds or amends liability coverage above and beyond a farm or ranch's general property insurance policy.

Why do agritourism activities require additional insurance?

While farm or ranch property liability insurance policies cover a wide range of risks, they often don't include the different types of risks that are involved in agritourism. That is, there is no coverage unless the landowner has added a specific agritourism rider to the general policy. That's because agritourism activities are not typical farming activities and involve participants who may have little familiarity or experience with being on a farm. And the activities themselves—wagon rides, horseback rides, petting zoos, hunting, fishing, corn mazes, bouncy houses—present a higher likelihood of harm than many ordinary activities. While those who engage in agritourism activities voluntarily choose to do so,

injuries can still happen even when an agritourism operator takes all precautions to protect the participants from harm.

Farmers and ranchers who host food concessions or directly market their meat, produce, baked goods or cottage foods to agritourism visitors are also engaging in higher risk product liability activities that are not common to many farming operations. For this reason, the possibility of a farm visitor contracting a foodborne illness is not usually addressed in a general farm liability policy. Covering the higher risk activities associated with agritourism activities and providing foods requires specific policy riders and additional insurance premiums.

When is agritourism insurance recommended?

A farmer or rancher who offers agritourism activities, whether or not for pay, should consider agritourism insurance. Each state defines agritourism differently; however, there are a number of activities generally considered "agritourism" that a landowner will want to ensure are covered by his or her policy, including:

- You-pick operations (pumpkins, apples, strawberries, sweet corn, asparagus, etc.)
- Hay wagon rides
- Corn mazes
- Petting zoos
- Horseback riding and pony rides
- Birdwatching
- Cut-your-own Christmas tree farms
- Camping sites
- Hunting and fishing
- Agricultural education and school tours
- Living history farms
- Farmers market events
- Food stands (produce and baked goods)
- Vineyard tours and wine tastings
- Cidery or brewery tours and tastings

As an agritourism operation grows, the business may add non-traditional agricultural activities that the business operator should make sure are covered by insurance. These include:

- Food and beverage service
- Wedding and event barns
- Farm bed and breakfasts
- Zip lines
- Climbing walls
- Inflatables
- Slides
- Ropes courses
- Paintball courses
- Archery
- Exercising with animals ("goat yoga")
- Festivals
- Mechanical rides
- All-Terrain Vehicle or golf cart rentals
- Haunted houses
- "Zombie hunting" with paintball guns or tomato launchers
- Any activities that use firearms or weapons
- Any activities conducted on or in water
- Any activities conducted near an open flame

How do agritourism immunity laws affect liability and insurance?

Different types of immunity laws can shield agritourism operations from certain liabilities, such as an "agritourism immunity law", a "recreational user statute", a "u-pick statute" or an "equine activity act." Even in states that have them, immunity laws don't offer absolute liability protection for the operator. The immunity laws typically only provide liability protection for specific activities or harm resulting from "inherent risks" of certain activities. An agritourism operator can be responsible in other instances, such as if the harm resulted from something that is not an "inherent risk," if the owner or an employee acts with negligence or recklessness, or if the operator fails to meet the requirements of the statute. Additionally, a state's immunity statute might have restrictions and eligibility requirements, such as extending immunity only for agritourism on a "commercial" farm or ranch or providing immunity only for those who don't charge a fee or financially benefit from the activity. See our factsheet on "Agritourism Immunity Laws in the United States" for more information. Ultimately, it is wise to consult an attorney and insurance agent to examine how applicable immunity statutes can reduce risk when determining the extent of coverage necessary for an agritourism operation.

How much will agritourism insurance cost?

The cost of a policy will depend upon a number of factors. These factors and their importance vary by insurance company, and each company has its own risk tolerance. An insurance agent will have to assess the risks at an agritourism operation, and is likely to consider:

- Types of activities offered.
- Number of activities offered.
- Attendance numbers.
- Risks inherent in the land.
- Precautions and management practices taken to minimize risk of injury.
- Compliance with laws, regulations, and industry best practices.
- Strength of a state's agritourism immunity law.

Further, the cost of a policy will depend upon whether the agritourism operator wishes to insure for legal defense costs, property and merchandise used for the agritourism operation, loss of income, and other business related expenses. The final cost of a policy will be the policyholder's decision, as caps may be placed on coverage to reduce the cost of the premium. A policyholder will want to independently assess the risks posed by his or her agritourism operation, and determine his or her own risk tolerance.

How does a farm or ranch obtain agritourism insurance?

Obtaining agritourism insurance coverage might require a farmer or rancher to shop around. The number of insurance companies offering agritourism insurance has increased over the past few years, making the market more competitive. However, not all insurance companies provide coverage for all types of agritourism activities. A farmer or rancher can always start by talking to the insurance agent and reading the current insurance policy to see what is covered.

If shopping around, look for a company that provides coverage for all of the operation's needs, is in sound financial strength, and is respected by other agritourism operators. Then select a reputable agent from the identified company who has experience with agritourism and is willing to invest time in getting to know the landowner and understanding the agritourism operation. Work with the agent to tailor the agritourism rider to reflect the types of agritourism activities offered.

What are recommended best practices for maintaining insurance coverage?

Insurance is a tool that few people wish to use but that most people maintain in the event it is needed. If an accident happens at an agritourism farm, the operator will want to know that the liabilities will be covered by insurance. Here are some tips on maintaining both your insurance coverage and your peace of mind:

- Always stay current on premium payments.
- Understand the limits of the policy.
- Stay in contact with the insurance agent.
- Regularly inspect the operation, and have the insurance agent do so as well.
- Consult with the insurance agent, and update the policy, when adding new activities to the farm.

Agritourism and insurance: next steps for agritourism operators

Learning about agritourism and insurance is an important first step for farmers and ranchers who want to host agritourism activities on their properties. In the following checklist, we provide considerations for examining agritourism insurance options. We also provide several additional resources on agritourism insurance. Our hope is that utilizing the checklist and resources will enable farmers and ranchers to continue on a path toward optimal agritourism liability risk management.

See our other Factsheets in this series for more resources on legal issues in agritourism.

Agritourism and Insurance: A Checklist

Agritourism operators may use this checklist as a tool to make sure that common insurance questions are answered, or at least considered, in the planning process. The list is not exclusive, but serves as a starting point in considering the types of insurance and how much insurance is necessary for the agritourism operation.

1. **Find an agritourism insurance provider.** Agritourism insurance is becoming increasingly common but not all insurance companies cover all agritourism activities, nor do all insurance agents have experience in working with agritourism clients. Some questions to ask before signing a policy include:
   - → What experience do you and your company have with insuring agritourism?
   - → What is your company's A.B. Best Rating? This is a measure of financial strength.
   - → What would happen in ____ situation? Run through hypotheticals with the agent.

2. **Assess insurance needs for all activities.** Review every type of agritourism activity with your insurance provider, assess the risks and coverage options for each activity, and understand whether there are exceptions, limits, or exclusions that could affect coverage for an activity. Specifically, an agritourism operator will want to know:

   - → Are all of the activities provided at my agritourism operation covered by this policy?
   - → What are the property or liability exclusions or limits in my agritourism policy?

3. **Create emergency response plans and training programs.** Even when all precautions are taken for safety, accidents and emergencies still occur. The harm that results from these accidents can be minimized by having a response plan in place that addresses what to do in the event of an accident or emergency, and by training staff to use the plan.

4. **Regularly inspect and review the agritourism operation.**

   - → Do regular inspections of the property to look for dangerous conditions that might be caused by human action, or simply inherent to the property, even if your state has an agritourism immunity statute.
   - → Advise your agent of any new or discontinued agritourism activities on the operation.
   - → Do an annual walk-through of the property with your insurance agent.

5. **Keep adequate records.** Document all safety measures taken to demonstrate that the agritourism operation took all reasonable precautions. Document the presence and servicing of all safety equipment, trainings, improvements to make the premises and activities safe, injuries and emergencies, and all other things that your insurance agent requires a record of or recommends.

   - → Does your applicable state immunity law require you to post a warning sign? If so, document that it is posted as required under the law.

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Note: The websites for many state Farm Bureaus and insurance companies contain additional helpful resources for agritourism operators. The National Agricultural Law Center and The Ohio State University are not sponsored by any state Farm Bureaus or insurance companies, nor do they endorse or recommend any particular insurer.

2019 MID-SOUTH AGRICULTURAL AND ENVIRONMENTAL LAW CONFERENCE – ONLINE CLE

Recent Legal Developments Involving Meat Labeling, Regulation of Cultured Meat, Milk Labeling, Glyphosate Litigation, and WOTUS

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Meat Labeling:

Montana Governor Signs Real Meat Act
On April 18, 2019, Montana Governor Steve Bullock signed legislation defining cell-cultured edible products, defining hamburger and ground beef, and clarifying when meat is mislabeled. (HB 327). Dubbed the "Real Meat Act", the legislation defines a cell-cultured edible product as a "concept of meat" that is produced from a cell culture and not from a whole slaughtered animal. Additionally, hamburger and beef are defined as being derived from the edible flesh of livestock or a livestock product and does not include cell-cultured edible products. Finally, any cell-cultured edible product labeled as meat is mislabeled if it does not meet the definition of meat.

Arkansas Governor Signs Truth in Labeling Bill
On March 18, 2019, Arkansas Governor Asa Hutchinson signed into law "Truth in Labeling" legislation seeking to prevent public deception regarding a food product's origin (HB 1407). Food products defined by the legislation include beef, livestock, pork, poultry, and rice. Under the legislation, meat is defined as being derived from "a livestock, poultry, or cervid carcass that is edible by humans." (A cervid is a mammal of the deer family.) The definition of meat, however, specifically excludes synthetic products derived from plants, insects, or from products grown in a lab. Failure to follow the state's new food labeling law could result in a civil penalty.

North Dakota Governor Signs Meat Labeling Bill
On March 12, 2019, North Dakota Governor Doug Burgum signed into law legislation defining the term "meat" and prohibiting the marketing of cell cultured proteins as a "meat food products" HB 1400). Cell-cultured products are derived from animal cells and are an attempt to grow meat-like human food products in a lab. The legislation defines the term meat as "the edible flesh of an animal born and harvested for the purpose of human consumption." Because cell-cultured proteins do not meet this definition, they may not be advertisement as "meat food products."

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Lawsuit Settled Regarding Missouri Meat Labeling Law

On February 12, 2019, the St. Louis Post Dispatch reported a settlement regarding a challenge to Missouri's law restricting the labeling of "meat" products. According to the report, under Missouri law, only products "derived from an actual cow, chicken, turkey or some other animal with two or four feet" may be marketed as meat. As a result, the ACLU and the makers of plant-based meat products sued alleging that the law violated free speech rights under the First Amendment. The report stated that the details of the settlement are still being processed and should be announced sometime in March.

Missouri Releases Guidance on Changes to Meat Advertising Law for Plant-Based Products

On August 30, 2018, the Missouri Department of Agriculture released guidance on the new changes to the Missouri Meat Advertising Law. The new legislation was part of an omnibus agriculture bill that was signed in June 2018. According to the law, advertising "or misrepresenting a product as meat that is not derived from harvested production livestock or poultry," constitutes a misleading or deceptive practice. The guidance states that products must include the qualifier such as "plant-based," "veggie," "lab-grown," "lab-created" before or after the product name. In addition, plant-based meat products must include a statement on the package that says the product is "made from plants" or "grown in a lab." These new rules will not be enforced until January 1, 2019.

Plant-Based Meat Companies Sue Missouri for Labeling Law

On August 27, 2018, the several organizations filed a complaint against the state of Missouri in the U.S. District Court for the Western District of Missouri challenging a law which prohibits companies from using the word "meat" on labels for plant-based products (*Turtle Island Foods, et al., v. Missouri*, No. 18-cv-4173). The new Missouri law, originally Senate Bill 627, was part of the omnibus agriculture bill signed in June 2018. It went into effect on August 28, 2018. According to the law, advertising "or misrepresenting a product as meat that is not derived from harvested production livestock or poultry," constitutes a misleading or deceptive practice. The plaintiffs, who include a plant-based meat corporation, argue that using meat terminology with qualifying and descriptive language accurately conveys to consumers the ingredients in their products. According to the plaintiffs, the law does nothing to protect consumers from potentially misleading information, and there is no evidence that consumers are confused about ingredients in plant-based meats. The plaintiffs allege that this law will only impede market competition.

Regulation of Cell-Cultured Food Products:

USDA and FDA Agree on Cell-Cultured Food Products Regulation

On March 7, 2019, the U.S. Department of Agriculture (USDA) and the U.S. Food & Drug Administration (FDA) announced a formal agreement regarding the regulation of human food products derived from the cells of livestock and poultry. Under the formal agreement, FDA will oversee cell collection, cell banks, and cell growth and differentiation. USDA will begin its oversight during the cell harvest stage and will subsequently oversee the production and labeling of human food products derived from the cells.

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USDA and FDA Address Regulation of Cell-Cultured Food Products
On November 16, 2018, the U.S. Department of Agriculture (USDA) and the U.S. Food and Drug Administration (FDA) issued a press release regarding oversight of livestock and poultry cell lines used to develop cell-cultured food products. According to the statement, moving forward, the two agencies will jointly oversee the production of cell-cultured food products derived from livestock and poultry. Accordingly, FDA will oversee cell collection, cell banks, and cell growth and differentiation. USDA will begin its oversight at the time of cell harvest and will oversee the production and labeling of subsequent food products.

FDA and USDA Hold Public Meeting on Cell Culture Technology Regulation
On October 23 and 24, 2018, the U.S. Department of Agriculture's Food Safety Inspection Service (FSIS) and the U.S. Food and Drug Administration (FDA) held a two-day joint public meeting titled, "The Use of Cell Culture Technology to Develop Products Derived from Livestock and Poultry." On September 10, 2018, U.S. Secretary of Agriculture Sonny Perdue and U.S. Food and Drug Administration Commissioner Scott Gottlieb announced the joint public meeting regarding the two agencies teaming up to regulate cell-cultured meat. Gottlieb stated that "advances in animal cell cultured food products present many important and timely technical and regulatory considerations for [both] the FDA" and the USDA. Accordingly, the joint-meeting's agenda included discussions on the current regulatory frameworks of the USDA and FDA involving foods and products of cell-culture technology. The meeting also addressed the potential hazards of cell-cultured meats and appropriate regulatory oversights. Recordings of the two-day meeting are available online through the FSIS website. Comments on this issue are due by November 26, 2018.

USDA and FDA Will Hold Public Meeting on Animal Cell Cultured Food Products
On September 10, 2018, the U.S. Department of Agriculture and the U.S. Food and Drug Administration announced a joint public meeting on the use of cell-culture technology to create animal food products. The meeting will focus on the labeling, oversight, and potential problems with animal cell-cultured food products. These products, often referred to as "clean meats," are created by adding nutrients *in vitro* to animal cells which grow into animal muscle tissue. The U.S. Cattlemen's Association has petitioned USDA to prohibit these products from being labeled or marketed as "beef" or "meat." USDA received over 6,000 comments on this petition. The two-day meeting will be held on October 23-24, 2018.

Milk Labeling:

National Milk Producers Federation Files Citizen Petition Regarding Dairy Labeling
On February 21, 2019, the National Milk Producers Federation (NMPF) submitted a Citizen Petition to the U.S. Food and Drug Administration (FDA) regarding the labeling of non-dairy products. NMPF seeks FDA enforcement of existing "imitation" labeling requirements when non-dairy plant-based foods use the terms milk, yogurt, cheese, ice cream, or butter. According to NMPF, these non-dairy substitutes are nutritionally inferior to standardized dairy foods, and when the terms are used, an "imitation" disclosure statement must be provided. Additionally, NMPF asks FDA to provide for regulations limiting when non-dairy substitutes may use

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standardized dairy food names such as milk, yogurt, cheese, ice cream, or butter. According to NMPF, FDA action is "necessary to ensure that consumers are adequately informed concerning the material differences between standardized dairy foods… and the wide variety of non-dairy substitutes that are available in the marketplace…"

Court Rejects Claim that "Almond Milk" is Mislabeled

On December 20, 2018, the U.S. Court of Appeals for the 9th Circuit affirmed a lower court's dismissal of a claim that an almond beverage had been mislabeled as "almond milk" (*Painter v. Blue Diamond Growers* 2:17-cv-02235). The plaintiff alleged that the almond beverage should have been labeled as "imitation milk" because the product is nutritionally inferior to dairy milk. According to the court, no jury would conclude that the product is inferior under the Food and Drug Administration's definition of nutritional inferiority (21 C.F.R. § 101.3(e)(4)). Additionally, the court affirmed the lower court's determination that no "reasonable consumer would 'assume that two distinct products would have the same nutritional content.'"

FDA Extends Comment Period for Labeling Plant-Based Products with Dairy Names

On November 20, 2018, the U.S. Food and Drug Administration (FDA) announced that the comment period regarding the labeling of plant-based products with dairy names has been extended by 60 days. FDA stated that it is seeking information to assist the agency examine "its approach to the use of dairy food names like 'milk,' 'cheese,' or 'yogurt' in the labeling of plant-based foods and beverages." Originally scheduled to close on November 27, 2018, comments may now be submitted to FDA up until January 28, 2019. FDA stated that the purpose of the extension is to allow for additional submissions from interested individuals.

FDA Announces Intent to Review Milk Labels on Plant-Based Products

On July 26, 2018, the U.S. Food & Drug Administration (FDA) released a statement from the Commissioner regarding identity standards for dairy products. The Commissioner stated that FDA will be reviewing food labels for plant-based foods that are being advertised as substitutes for standard dairy products. Plant-based products can be made from soy, almond, or rice and are being labeled by manufacturers as "milk." FDA will examine the differences between plant-based products and dairy in relation to potential health consequences. Traditional dairy products and plant-based products contain nutritional differences relating to protein and vitamin content. FDA will review whether consumers understand the dietary differences and whether they are being misled when the term milk is applied to plant-based products.

FDA Intends to Limit the Labeling of "Milk" to Dairy Products

On July 17, 2018, Politico reported that U.S. Food and Drug Administration's (FDA) Commissioner Scott Gottlieb's intends to enforce regulations recognizing the term "milk" as a dairy product, instead of a plant-based product. The National Milk Producers Federation (NMPF) previously sent comments to the FDA calling for enforcement action to be taken. The NMPF was encouraged by Gottlieb's comments, stating that several non-dairy products were misleading to consumers because they did not contain the same nutritional value as dairy products. The NMPF is hopeful that the FDA will begin enforcing federal labeling standards soon, holding food marketers accountable for the terms used on non-dairy products.

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Glyphosate Litigation:

EPA Reaffirms that Glyphosate is not a Risk to Public Health
On April 30, 2019, the U.S. Environmental Protection Agency (EPA) issued a press release asserting that the pesticide glyphosate is not carcinogenic and when used correctly does not pose a health risk. According to EPA, when the users of glyphosate properly follow current product labeling, the pesticide causes no risk to humans. While EPA asserts that the pesticide is not harmful to the public health, the agency is proposing management measures intended to make glyphosate application more effective and efficient. Specifically, EPA seeks to develop procedures that protect pollinators and decrease weed resistance to glyphosate.

Jury Awards $80m in Phase 2 of Glyphosate Lawsuit
On March 27, 2019, a jury in a U.S. District Court for the Northern District of California awarded plaintiff Edwin Hardeman over $80 million in damages due to his use of Monsanto's glyphosate-based herbicide Roundup (*Hardeman v Monsanto Company*, 3:16-cv-00525). Previously, in phase one of the trial, the jury ruled that Mr. Hardeman's non-Hodgkin's lymphoma was caused by Roundup. In phase two of the trial, the jury found that Monsanto had negligently failed to warm Mr. Hardeman of the risks associated with Roundup. Accordingly, the jury awarded Mr. Hardeman $5,267,634.10 in compensatory damages and $75,000,000 in punitive damages.

California Federal Jury Finds Glyphosate Caused Cancer
On March 19, 2019, Bayer announced that a federal jury in California has ruled that plaintiff Edwin Hardeman's non-Hodgkin's lymphoma was caused by the company's glyphosate-based herbicide Roundup. While the jury reached a decision in the first phase of the trial regarding causation, it still must decide the question of liability in phase two of the trial. According to Bayer, "We are disappointed with the jury's initial decision, but we continue to believe firmly that the science confirms that glyphosate-based herbicides do not cause cancer. We are confident the evidence in phase two will show that Monsanto's conduct has been appropriate and that the company should not be liable for Mr. Hardeman's cancer."

Lawsuit Claims Roundup Harmed Home Gardeners Gut Bacteria
On February 13, 2019, Bloomberg reported that a lawsuit has been filed in a Missouri federal court alleging that the healthy gut bacteria of home gardeners were harmed as a result of the pesticide Roundup. According to the report, the home gardener plaintiffs assert that they were deceived by labels on Roundup which assured consumers that the products were not harmful to humans or pets. The plaintiffs allege, however, that "Roundup's active ingredient glyphosate attacks an enzyme also found in the beneficial intestinal bacteria of humans and some animals."

Judge Allows Evidence Alleging Monsanto Sought to Influence Glyphosate Studies
On January 28, 2019, Reuters reported that a U.S. district judge has permitted "controversial evidence" in three separate lawsuits alleging that the glyphosate-based Roundup weed killer causes cancer. According to the report, U.S. District Judge Vince Chhabria has ruled that the plaintiffs can introduce evidence alleging that Monsanto had attempted to "ghostwrite studies and influence the findings of scientists and regulators during the first phase of upcoming trials."

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According to Reuters, of the currently 9,300 Roundup cases nationwide, 620 are before judge Chhabria.

California Judge Upholds Verdict against Monsanto for Glyphosate Exposure
On October 22, 2018, a judge for San Francisco's Superior Court of California denied Monsanto's motion for judgement notwithstanding the verdict as well their request for a new trial in the Dewayne Johnson case. Bayer Ag unit Monsanto filed the aforementioned motions after an August 10, 2018 jury verdict awarded the plaintiff, Dewayne Johnson, $289M for successfully arguing that years of exposure to Monsanto's Roundup caused him to be diagnosed with non-Hodgkin lymphoma. (*Dewayne Johnson v. Monsanto Co.*, case no. CGC-16-550128). While the judge upheld the verdict, she slashed the punitive damages to equal that of the compensatory damages, reducing the total jury award to $78M instead of $289M. Plaintiff has until December 7, 2018 to accept the modified award or a new trial will be granted to determine punitive damages. For more background information on this case, please see the Ag Law Weekly Review for August 16, 2018, and September 27, 2018.

Bayer's Monsanto Fights $289M California Jury Award for Glyphosate Exposure
On Tuesday, September 18, 2018, Bayer AG unit Monsanto motioned for a judgment notwithstanding the verdict to strike a $289M jury award from San Francisco's Superior Court of California, as well as moved for a new trial. The jury verdict in question came on August 10, 2018, after plaintiff, Dewayne Johnson, argued that years of exposure to Monsanto's Roundup caused him to be diagnosed with non-Hodgkin lymphoma. (*Dewayne Johnson v. Monstanto Co.*, case no. CGC-16-550128). For more information on this case, see the Ag Law Weekly Review from August 16, 2018. In its motion to the court, Monsanto alleges that the scientific evidence in the case "falls far short" of the "sufficient and substantial" evidence requirements in California. Shortly after the trial, Monsanto's Vice President, Scott Partridge, released a statement questioning opposing counsel's conduct, which he says "distorted the facts and used baseless and egregious emotional appeals to inflame the jury." A hearing on the motions has been set for October 10, 2018.

Brazilian Judge Overturns Glyphosate Ban
On September 3, 2018, an injunction banning glyphosate from Brazil was overturned, according to a Reuters article. Last month, on August 6th, a Brazilian judge issued a ruling prohibiting the registration of any new products containing glyphosate, abamectin, and thriam. That judge also suspended current registrations for those chemicals in order for the government to complete an evaluation. Monsanto extensively markets Roundup Ready glyphosate-resistant soybeans within Brazil. According to Reuters, in the most recent court order, the judge stated that the prohibition of these chemicals was unjustified.

WOTUS:

EPA Declines to Extend WOTUS Comment Period
On March 19, 2019, Greenwire reported that the U.S. Environmental Protection Agency (EPA) and the U.S. Department of the Army (Army) have declined to extend the 60-day comment period regarding a proposed rule redefining the scope of waters federally regulated under the

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Clean Water Act. Previously, on February 14, 2019, the EPA and the Army published notice in the Federal Register of the proposed rule revising the agencies definition of "waters of the United States" issued on June 29, 2015 (84 FR 4154). With the published notice, members of the public were given until April 15, 2019 to submit comments on the proposed definition. According to Greenwire, certain stakeholders and members of Congress had attempted to argue that the 60-day comment period was not enough time to review the proposal. For more information regarding the proposed rule, see the January 9, 2019 Agricultural Law in the Spotlight article entitled: *U.S. EPA and Army Corps of Engineers Issue Proposed Revised Definition of "Waters of the United States"*.

EPA Withdraws WOTUS Applicability Date

On March 8, 2019, the U.S. Federal Government announced it was withdrawing its appeals of two lower court decisions enjoining and vacating the U.S. Environmental Protection Agency and U.S. Department of the Army (the agencies) 2018 Applicability Date Rule delaying the 2015 "waters of the United States" (WOTUS) rule. Previously, on January 31, 2018, the agencies issued a final rule that added an applicability date to the 2015 Rule. As a result, the 2015 Rule was not scheduled to become applicable until February 6, 2020. Subsequently, the U.S. District Courts for the District of South Carolina and the Southern District of Washington enjoined and vacated the 2018 Applicability Date Rule. The agencies stated that instead of litigating the 2018 Applicability Date Rule they have decided to focus their efforts on revising the 2015 Rule's definition of WOTUS.

Proposed WOTUS Rule Published for Public Comment

On February 14, 2019, the Environmental Protection Agency (EPA) and the Department of the Army published notice in the Federal Register of a proposed rule defining the scope of waters federally regulated under the Clean Water Act (84 FR 4154). With the published notice, members of the public have until April 15, 2019 to submit comments on the proposed definition. If enacted, the proposal would replace the controversial definition previously issued by the agencies on June 29, 2015. For more information on the proposed rule, see the EPA's Waters of the United States (WOTUS) Rulemaking website.

EPA Announces Public Hearing for Proposed Revised Definition of WOTUS

The Environmental Protection Agency and the U.S. Department of the Army announced that on February 27 and February 28, 2019, the agencies will hold a public hearing regarding a proposed rule revising the definition of "waters of the United States." The public meeting will be held in Kansas City, Kansas, and will provide the public the opportunity to present data, information, or views regarding the proposed rule. The pre-publication version of the proposed rule can be found at https://www.epa.gov/wotus-rule/step-two-revise. The comment period on the proposed rule will end 60 days after notice of the proposed rule is published in the Federal Register

Revised "Waters of the United States" Definition Proposed

On December 11, 2018, the U.S. Environmental Protection Agency (EPA) and the Department of the Army (Army) announced a proposed definition of "waters of the United States" (WOTUS) intended to clarify federal authority under the Clean Water Act. EPA Acting Administrator Andrew Wheeler stated that "[o]ur proposal would replace the Obama EPA's 2015 definition with one that respects the limits of the Clean Water Act and provides states and landowners the

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certainty they need to manage their natural resources and grow local economies." According to the EPA and the Army, comments on the proposal will be accepted for 60 days following publication in the Federal Register. The Revised Definition of "Waters of the United States" Proposed Rule - Pre-publication Version may be viewed here.

Washington Judge Vacates WOTUS Applicability Date

On November 28, 2018, the U.S. District Court, W.D. Washington vacated the U.S. Environmental Agency and U.S. Department of the Army (the agencies) addition of an applicability date to the 2015 Rule defining "waters of the United States" (*Puget Soundkeeper Alliance v. Wheeler*, Case 2:15-cv-01342-JCC). On January 31, 2018, the agencies issued a final rule that added an applicability date to the 2015 Rule. As a result, the 2015 Rule was not scheduled to become applicable until February 6, 2020. According to U.S. District Judge John C Coughenour, however, the agencies violated the Administrative Procedure Act by excluding "relevant and important comments" before promulgating the 2015 Rule applicability date. Therefore, the court ruled that the applicability date was unlawful and should be vacated nationwide.

Court Enjoins WOTUS Rule in Iowa

On September 18, 2018, the U.S. District Court for North Dakota issued a court order enjoining the Waters of the United States rule (WOTUS) in Iowa (*State of North Dakota, et al, v. EPA, et al*, Case No. 3:15-cv-59). The WOTUS rule has now been suspended in more than half of the fifty states. On August 16, 2018, a federal district court in South Carolina enjoined the WOTUS rule in twenty-four states. A month later, on September 12, 2018, the U.S. District Court for the Southern District of Texas enjoined WOTUS in Texas, Louisiana, and Mississippi (*State of Texas, et al. v. EPA, et al*, 3:15-CV-00162).

Several States File Suit Requesting Stay of WOTUS Rule

On August 22, 2018, several states filed suit in the U.S. District Court for the Southern District of Texas against the U.S. Environmental Protection Agency (EPA) to request a nationwide stay of the Waters of the United States or WOTUS rule (*State of Texas, et al., v. U.S. Environmental Protection Agency, et al.*, No. 3:15-cv-0162). In a recent court order from August 16, 2018, a federal district court in South Carolina suspended the WOTUS rule for twenty-four states. The plaintiff states – Louisiana, Mississippi, and Texas – argue that this inconsistency across state lines will cause irreparable harm.

Federal District Court Overturns Delay of WOTUS

On August 16, 2018, the U.S. District Court for the District of South Carolina, Charleston Division issued a ruling overturning the delay of the Waters of the United States (WOTUS) rule (*South Carolina Coastal Conservation League, et al.* v. *U.S. Environmental Protection Agency, et al.*, 2018 WL 2933811). In light of several U.S. Supreme Court decisions, the Environmental Protection Agency (EPA) issued a final rule redefining WOTUS in 2015. The 2015 final rule prompted a series of lawsuits which led to a 2017 Presidential Executive Order directing EPA to review and then rescind or revise WOTUS. On February 8, 2018, EPA published a new final rule delaying enforcement of the 2015 final rule. The current court order suspends this rule, stating that by not allowing meaningful opportunity for public comment, EPA's 2015 final rule was arbitrary and capricious.

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EPA and Army Seek Additional Comment Regarding Repeal of WOTUS Rule
On July 12, 2018, the U.S. Environmental Agency (EPA) and the Department of the Army (Army) published notice in the Federal Register seeking additional comment on the agencies' proposal to repeal the 2015 rule defining Waters of the United States (WOTUS) (83 FR 32227). On July 27, 2017, EPA and the Army announced a proposal to permanently repeal the 2015 WOTUS rule (82 FR 34899). Subsequently, the agencies accepted comments on the proposed repeal from July 27, 2017, through September 27, 2017. During that time, the agencies received more than 685,000 comments from interested parties. Because of this large response, EPA and the Army determined that it would be in the public interest to provide an additional opportunity for comment. Accordingly, the agencies will accept comments until August 13, 2018. Nevertheless, EPA and the Army stated, that "regardless of the timing or ultimate outcome of [the] additional rulemaking, the agencies are proposing a permanent repeal of the 2015 Rule at this stage."

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State Right to Farm Statutes

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All fifty states have enacted right-to-farm statutes. These laws are meant to protect farmers from nuisance lawsuits in the case where an individual moves to an area where a farming operation previously exists or in cases where the farm has existed for a period of time substantially unchanged before the lawsuit is filed. In earlier nuisance suits, defendant farmers saw mixed success defending these nuisance claims with the common law defense that the plaintiff "came to the nuisance." As a result, legislatures have responded and provided statutory protection to farmers to provide a defense to nuisance suits of this kind. These statutes are referred to as right-to-farm statutes. It is important to note that while all fifty states have enacted right-to-farm statutes that there exists substantial variation across the country and the purpose of this paper is to give a broad overview of some of the major trends in this type of legislation.

Triggering Event

A triggering event is an event that causes or triggers grounds to invoke the right-to-farm statute as a defense to a nuisance lawsuit. Three triggering events have been identified for the purposes of this project: (1) Statutes of

repose, (2) Being first in time, and/or (3) An area zoned for agriculture.

A statute of repose is written so that an agricultural or farming operation shall not become a nuisance after it has been in operation for a certain period of time. This period of time is typically between one and three years.

Triggering Event
Statutes of repose:
25 states

A first in time provision means that a farming operation will not be deemed a nuisance so long as it was first in time. Usually, this refers to the farming operation being established before one or more of the uses on surrounding land.

Triggering Event
First in time provision:
19 states

The area zoned for agriculture triggering event refers to whether the farming operation is required to be within an area that has been formally zoned for agriculture.

Triggering Event
Area zoned for agriculture:
9 states

Change in the Operation

Half of the states have a provision in the right-to-farm statute that identify whether or not a change in the farming operation will have an effect on the farm's ability to be considered a nuisance.

Change in operation provisions are structured differently per state, states that have structured the provision similarly are grouped as follows:

- Certain changes in operation like ownership, technology, methods of production, or the product itself product are not considered “changes” that would subject a farming operation to liability.

Change in Operation
Enumerated changes approach: 5 states

- Other states permit changes such as an expansion of the operation and allow those changes to retain the commencement date of the original operation in assessing whether a nuisance claim can be brought.

Change in Operation
Permit expansions and retain original date: 4 states

- A different group of states provide that if there are “substantial changes” to the farming operation, then the right-to-farm nuisance exception does not apply to those changes.

Change in Operation
“Substantial changes” ineligibility: 6 states

- Some states do not allow “reasonable expansion” to constitute a nuisance. Both of these statutory provisions give examples or define what is considered “reasonable” or not reasonable.

Change in Operation
Reasonable expansion exception: 2 states

- Other states provide that if there is a change in operation such as an expansion, the date of commencement for the operation changes as well.

Change in Operation
If expansions, date of commencement changes: 4 states

- Finally, some allow for changes in operation to not be considered a nuisance so long as all other applicable laws in the jurisdiction are being followed.

Change in Operation
Compliance with other laws: 2 states

Limitation on Protections

There are various limitations on the protections provided by right-to-farm statutes. Some states condition nuisance protection under right-to-farm statutes on the farming operation's compliance with state and federal laws and if the operation is following good agricultural practice. Also, if the health and safety of the public is implicated, some states do not allow for nuisance suit protection under right-to-farm laws.

The vast majority of states have provisions that limit the protection of the right-to-farm statute. These limitations fall into at least one of the following categories.

- Compliance with State and Federal Laws: The farming operation must be compliant with the applicable state and federal laws, the right-to-farm nuisance suit protection would not apply.
- Following Good Agricultural Practice: Various states' right-to-farm laws are only applicable to farms following good agricultural practices. Some states may specifically define what is considered good agricultural practice, other states have provisions that

Limitation on Protections
Compliance with state & federal laws: 27 states

Limitations on Protections
Following good agricultural practice: 26 states

generally require the farming operation to comply with good agricultural practices as required by industry customs.

- Public Health and Safety: If the farming operation has an adverse effect on public health and safety, the operation may be considered a nuisance.

Limitation on Protections
Public health and safety: 15 states

Preemption of Local Government Actions

Some right-to-farm statutes have a provision that explicitly allows the right-to-farm to preempt any local government actions or ordinances that may conflict with the right-to-farm statute.

Preemption of Local Government Action
21 states

Attorney's Fees Awarded

Fifteen states contain a provision in the right-to-farm statute that awards attorneys' fees. Some will award attorneys' fees to the defendant farming operation if the nuisance suit is deemed to be frivolous, malicious, and/or the defendant farming operation can prevail in proving that the operation was not a nuisance.

Attorney's Fees
15 states

Other statutes provide that the prevailing party can be awarded attorney's fees. These states do not specify that only the defendant if prevailing can be awarded fees.

Damage Caps

Very few right-to-farm statutes provide specific damage caps by the

Damage Caps
7 states impose damage caps through the state's right-to-farm statute

statute itself. These provisions limit the amount of money that can be obtained in compensatory damages. Each of these statutes provides specific formulas that cap the amount of damages that can be recovered. Many of these caps may not be found with the right-to-farm statutes and in some states the constitutionality of these caps may be in question.

5/30/18

Issue Brief Series: 2018

AGRICULTURAL & FOOD LAW CONSORTIUM

The Agricultural & Food Law Consortium, led by the National Agricultural Law Center, is a national, multi-institutional collaboration designed to enhance and expand the development and delivery of authoritative, timely, and objective agricultural and food law research and information.

This material is based upon work supported by the National Agricultural Library, Agricultural Research Service, U.S. Department of Agriculture.

Smithfield Foods and Right to Farm in North Carolina

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A recent series of cases out of North Carolina on nuisance litigation against swine farms has generated a great deal of interest in Right to Farm statutes. All fifty states have a Right to Farm statute; however significant questions often arise on when they apply, what they do, and how they work. The purpose of this Issue Brief is to succinctly describe the situation in North Carolina and look at why the Right to Farm statute did not apply to those operations in this specific case.

The cases in North Carolina all involve nuisance litigation against a division of Smithfield Foods. A nuisance is a substantial interference with another's use and enjoyment of their property. In this specific case, the nuisance litigation was concerning odor from the swine operations that the defendant contracted with in order to raise the swine. In total, twenty-nine lawsuits, involving around 500 plaintiffs, were filed against Murphy-Brown, a division of Smithfield foods, alleging that the swine farms that they contracted with failed to minimize odors by using open lagoons to store manure until it could be applied to fields and that the odor from these lagoons constituted a nuisance under North Carolina law.

North Carolina, like every other state, has a Right to Farm statute. The purpose of a Right to Farm statute is to provide an affirmative defense for agricultural operations that are facing nuisance litigation so long as certain criteria are met. This defense is based off of an old common law defense called "coming to the nuisance." The "coming to the nuisance" defense could be used if the neighbor bringing the nuisance action moved next to a piece of land where the current use of the land constituted a nuisance. The judge in the case had complete discretion on whether to use "coming to the nuisance" as a defense or to find that the neighbor's use of their property constituted a nuisance. Right to Farm statutes codify this old common law defense and provide a series of factors to determine if a state Right to Farm statute will apply.

In the case of North Carolina, the triggering language for the Right to Farm Statute stated:

> "No agricultural or forestry operation or any of its appurtenances shall be or become a nuisance, private or public, by any changed conditions in or about the locality outside of the operation after the operation has been in operation for more than one year, when such operation was not a nuisance at the time the operation began." NC Gen Stat § 106-701 (2013).

In interpreting this provision the judge in North Carolina ruled that the Right to Farm statute did not apply under these circumstances because the neighbors, or their relatives, bringing the nuisance actions lived on their property before the swine farms were established. Because people had resided in the area before the swine farms were established the judge ruled that the nuisance actions were not filed as a result of changed conditions in the area and granted a motion for summary judgement against the Right to Farm defense.

Three of the twenty-nine lawsuits have been heard and all three cases awarded substantial damages to the neighbors. Also at play in North Carolina is a statute that caps punitive damages at three times the amount of the actual damages awarded. The first trial had ten plaintiffs and resulted in a total judgement in excess of $50 million; however the actual damages awarded were for $75,000 each so with the damage cap the total amount awarded was $3.25 million. The second trial ended with a jury verdict of $25.13 million, but was reduced to $630,000. The third trial ended with a verdict of $473.5 million which was reduced to $94 million by the statutory damages cap. Murphy-Brown has already given notice that it intends to appeal the cases. In the meantime, the other twenty-six cases are being scheduled for trial.

As a result of the litigation the North Carolina legislature has amended the state Right to Farm statute; however these changes will not affect the cases that have already been filed against Murphy-Brown. For nuisance litigation in North Carolina going forward the triggering language has been modified so that in order to successfully bring a nuisance action against a farming operation the plaintiff must be the legal possessor of the property at issue, they must be located within one half mile of the source of the alleged nuisance, and they must file the lawsuit within one year of the establishment of the farming operation or a fundamental change to the farming operation. The legislature also changed the way damages could be assessed for the nuisance lawsuits. Now the damages are capped by the reduction in the fair market value of the property for permanent nuisances and the diminution of fair rental value for temporary nuisances. Punitive damages are prohibited against farming operations unless there is a criminal conviction or civil enforcement action brought by a state or federal environmental enforcement agency within the past three years of when the alleged nuisance first began.

STATUTES:

Fifty State Compilation of Right to Farm Statutes

N.C. Gen. Stat. Ann. § 1D-25
N.C. Gen. Stat. §§ 106-700 to 106-702.

ADDITIONAL RESOURCES:

In re NC Swine Farm Nuisance Litigation, No. 5:15-CV-00013-BR, 2017 WL 5178038, at *6 (E.D.N.C. Nov. 8, 2017).

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Defining *Hemp*: A Fact Sheet

Updated March 22, 2019

Congressional Research Service
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R44742

CRS REPORT
Prepared for Members and
Committees of Congress

Botanically, hemp and marijuana are from the same species of plant, *Cannabis sativa*,[1] but from different varieties or cultivars.[2] However, hemp and marijuana are genetically distinct forms of cannabis that are distinguished by their use and chemical composition as well as by differing cultivation practices in their production. While marijuana generally refers to the cultivated plant used as a psychotropic drug (whether used for medicinal or recreational purposes), hemp is cultivated for use in the production of a wide range of products, including foods and beverages, personal care products, nutritional supplements, fabrics and textiles, paper, construction materials, and other manufactured and industrial goods. *Hemp* and *marijuana* also have separate statutory definitions in U.S. law.

Despite these differences, growing hemp has been restricted in the United States until recently, and the U.S. market has been largely dependent on imports for finished products and as an ingredient for use in further processing. Hemp's association with marijuana placed its production under U.S. drug laws wherein all cannabis varieties, including hemp, were considered Schedule I controlled substances under the Controlled Substances Act (CSA).[3] Since the late 1950s, the U.S. Drug Enforcement Administration (DEA) has strictly controlled and regulated hemp production. Prior to the late 1950s, hemp in the United States was considered an agricultural commodity, and the U.S. Department of Agriculture (USDA) supported its production.[4]

Restrictions on U.S. hemp production and marketing were relaxed by changes enacted in the 2014 farm bill (Agricultural Act of 2014, P.L. 113-79) and were further relaxed in the 2018 farm bill (Agriculture Improvement Act of 2018, P.L. 115-334). These changes provide further differentiation between hemp and marijuana in terms of farm policy and federal regulatory oversight.

The Food and Drug Administration (FDA) maintains oversight of hemp-derived consumer products under the Federal Food, Drug, and Cosmetic Act (21 U.S.C. §§ 301 *et seq.*). FDA's jurisdiction includes hemp and hemp-derived products as a food and food ingredient, as well as an ingredient for use in body products, cosmetics, dietary supplements, and therapeutic products.

Hemp and marijuana are distinct in several key ways: (1) statutory definitions and regulatory oversight, (2) chemical and genetic compositions, and (3) production practices and use. This fact sheet describes these differences, which are summarized in **Figure 1**.

[1] In this report, *cannabis* refers to the plant species *Cannabis sativa* and all of its industrial, medicinal, and recreational varieties. The terms *industrial hemp* and *hemp* are used interchangeably, and the term *marijuana* refers to the plant used as a medicinal or recreational drug unless otherwise specified. The terms *Cannabis sativa* L denote use of the Linnean system of taxonomy.

[2] *Plant varieties* and *cultivars* both refer to unique characteristic of a particular plant, but they differ overall: Varieties often occur in nature, and most varieties are true to type, meaning that seedlings grown from a variety will also have the same unique characteristic of the parent plant. Cultivars are cultivated varieties and not necessarily true to type, since certain traits have been selected by growers. See Cindy Haynes, "Cultivar versus Variety," Iowa State University, February 6, 2008, https://hortnews.extension.iastate.edu/2008/2-6/CultivarOrVariety.html.

[3] 21 U.S.C. §§801 *et seq.*; Title 21 C.F.R. Part 1308.11.

[4] Strictly speaking, the CSA does not make growing hemp illegal, but makes it illegal to grow without a DEA permit.

Figure 1. Differences Between Hemp and Marijuana

	Hemp	Marijuana
Botanical Name	*Cannabis sativa*	*Cannabis sativa*
Statutory Definition	"the plant Cannabis sativa L. and any part of that plant, including the seeds thereof and all derivatives, extracts, cannabinoids, isomers, acids, salts, and salts of isomers, whether growing or not, with a delta-9 tetrahydrocannabinol [delta-9 THC] concentration of not more than 0.3 percent on a dry weight basis" (Section 297A of the Agricultural Marketing Act of 1946 (AMA)).	"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, manufacture, salt, derivative, mixture, 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" (21 U.S.C. §802(16)).
Content Threshold for Psychoactive Compounds	No more than 0.3% delta-9 THC on a dry weight basis (THC is one of the leading psychoactive cannabinoids in cannabis)	No THC threshold specified
Other Cannabinoids	Reportedly more than 60 cannabinoids (including CBD and other nonpsychoactive compounds)	Reportedly more than 60 cannabinoids (including CBD and other nonpsychoactive compounds)
Psychoactive Properties	Nonpsychoactive	Psychoactive
Primary U.S. Laws	Agricultural Marketing Act of 1946 (AMA, 7 U.S.C. 1621 et seq.) Federal Food, Drug, and Cosmetic Act (FFDCA; 21 U.S.C. §§ 301 et seq.)	Controlled Substances Act (CSA, 21 U.S.C. §§801 et seq.) Federal Food, Drug, and Cosmetic Act (FFDCA; 21 U.S.C. §§ 301 et seq.)
Primary Federal Agencies with Regulatory Oversight	U.S. Department of Agriculture (USDA) Food and Drug Administration (FDA) (U.S. Department of Health and Human Services (HHS))	U.S. Drug Enforcement Administration (DEA) (U.S. Department of Justice (DOJ)) Food and Drug Administration (FDA) (U.S. Department of Health and Human Services (HHS))
Plant Part Used	Fiber, seed, and flower	Flower
Types of Products	Food and food ingredient; ingredient for body products, cosmetics, dietary supplements and therapeutic products; textiles and fabrics; other manufactured and industrial products	Recreational and medicinal products
Plant Height at Harvest	10-15 feet (fiber), 6-9 feet (seed), 4-8 feet (flower)	4-8 feet (flower)

Source: CRS from various governmental and industry sources.

Statutory Definition and Regulatory Oversight

Congress expanded the definition for *hemp* in the 2018 farm bill (amending the 2014 farm bill definition of *industrial hemp*), further distinguishing hemp and marijuana under U.S. law. *Hemp* is codified in Section 297A of the Agricultural Marketing Act of 1946 (AMA, 7 U.S.C. 1621 *et seq.*) as follows:[5]

> the plant *Cannabis sativa* L. and any part of that plant, including the seeds thereof and all derivatives, extracts, cannabinoids, isomers, acids, salts, and salts of isomers, whether growing or not, with a delta-9 tetrahydrocannabinol concentration of not more than 0.3 percent on a dry weight basis.

As defined in statute, hemp must contain no more than a 0.3% concentration of delta-9 tetrahydrocannabinol (delta-9 THC)—marijuana's primary psychoactive chemical. In general, a level of about 1% THC is considered the threshold for cannabis to have a psychotropic effect or an intoxicating potential.[6] Some suggest that cannabis with a THC level of greater than 1% be considered a drug varietal (e.g., marijuana),[7] with some suggesting that marijuana plants often have a THC level of 5% or more.[8] In the United States, hemp varieties or cultivars having less than 0.3% THC may be cultivated under USDA-approved license as hemp, while plant varieties or cultivars having higher amounts of THC may not be cultivated as they are considered to have too high a potential for drug use.[9]

By contrast, *marijuana* (or "marihuana," as it is spelled in the older statutes) is more broadly defined in the CSA and does not specify a permissible limit for THC or any other cannabinoid:

> (16) 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, manufacture, salt, derivative, mixture, 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.[10]

Marijuana is a Schedule I controlled substance under federal law, and, as such, the unauthorized manufacture, distribution, dispensation, and possession of marijuana is prohibited.[11] Cannabis

[5] A definition of *hemp* was originally established in the 2014 farm bill and amended by the 2018 farm bill (P.L. 115-334, §10113). The 2014 farm bill defined *industrial hemp* to mean "the plant *Cannabis sativa* L. and any part of such plant, whether growing or not, with a delta-9 tetrahydrocannabinol concentration of not more than 0.3 percent on a dry weight basis" (7 U.S.C. §5940(b)(2)).

[6] See, for example, E. Small and D. Marcus, "Hemp: A New Crop with New Uses for North America," in *Trends in New Crops and New Uses*, ed. J. Janick and A. Whipkey (Alexandria, VA: American Society for Horticultural Science Press, 2002).

[7] F. Grotenhermen and M. Karus, "Industrial Hemp Is Not Marijuana: Comments on the Drug Potential of Fiber Cannabis," nova-Institute, http://www.internationalhempassociation.org/jiha/jiha5210.html.

[8] See, for example, M. Shipman, "Is Hemp the Same Thing as Marijuana?," North Carolina State University, February 15, 2019, https://phys.org/news/2019-02-hemp-marijuana.html; and D. Donnon, A. T. Kearney, "The New Green Rush," presented at a Food Institute webinar, January 31, 2019.

[9] E. Small and D. Marcus, "Tetrahydrocannabinol Levels in Hemp (*Cannabis sativa*) Germplasm Resources," *Economic Botany*, vol. 57, no. 4 (October 2003); and G. Leson, "Evaluating Interference of THC Levels in Hemp Food Products with Employee Drug Testing" (prepared for the province of Manitoba, Canada), July 2000.

[10] 21 U.S.C. §802(16).

[11] Generally, all cannabis varieties are commonly considered to be of a single species. However, not all researchers

that exceeds the 0.3% delta-9 THC concentration limit falls under the definition of *marijuana* and the CSA. THC levels in marijuana reportedly average about 10%, with a high of 30% concentration.[12] However, advancements in cannabis breeding have introduced plant varieties with even higher levels of THC and other cannabinoids.[13]

The definition of *industrial hemp* enacted in the 2014 farm bill allowed for hemp cultivation under certain narrowly prescribed circumstances—namely, for research purposes by research institutions and state departments of agriculture in states with laws allowing for hemp production. Although hemp production was allowed in accordance with the requirements of the 2014 farm bill provision, other aspects of production were still subject to CSA regulations and DEA oversight, including the importation of viable seeds, which still required DEA registration according to the Controlled Substances Import and Export Act (21 U.S.C. §§951-971). This and other requirements were reinforced in a 2016 joint Statement of Principles on Industrial Hemp issued by DEA, USDA, and FDA.[14] The 2016 guidance also clarified DEA's contention that the commercial sale or interstate transfer of hemp continued to be restricted. A May 2018 internal directive by the DEA later clarified that certain "products and materials that are made from the cannabis plant and which fall outside the CSA definition of marijuana (such as sterilized seeds, oil or cake made from the seeds, and mature stalks) are not controlled under the CSA."[15] Accordingly, such products may be sold and distributed throughout the United States without restriction under the CSA or its implementing regulations. The 2018 directive, however, does not apply to cannabis extracts and resins.[16]

The 2018 farm bill further expanded upon hemp policies in the 2014 farm bill by amending the CSA and removing *hemp* from the CSA definition of *marijuana* (21 U.S.C. §802(16)).[17] Removing *hemp* (as defined in AMA Section 297A) from the CSA—and thus removing it from being considered a controlled substance—effectively permits the cultivation, processing, marketing, and sale of hemp and any cannabinoid derived from hemp that is produced by an authorized grower in accordance with the 2018 farm bill, associated federal USDA regulations, and applicable state regulations. The 2018 farm bill also excludes THCs in hemp (as defined) from Schedule I of the CSA.[18] All other cannabis and cannabis-derived products remain a Schedule I substance under federal law and are thus subject to CSA regulations and DEA oversight, except for certain drug products approved by FDA. Regardless of whether a substance is hemp-derived, it is FDA's view that it is unlawful to market food or dietary supplements

agree on a single taxonomy. Other cannabis species may include *Cannabis indica* (meaning from India) and its known subspecies. See, for example, R. C. Clarke and M. D. Merlin, "Cannabis Taxonomy: The 'Sativa' versus 'Indica' Debate," *HerbalGram*, vol. 13, no. 4 (April 2016).

[12] Based on sample tests of illegal cannabis seizures from December 2007 through March 2008. National Institute of Drug Abuse, "Quarterly Report, Potency Monitoring Project," University of Mississippi, 2008.

[13] See, for example, M. A. ElSohly et al., "Changes in Cannabis Potency over the Last Two Decades (1995-2014): Analysis of Current Data in the United States," *Biological Psychiatry*, vol. 79, no. 7 (April 1, 2016): pp. 613-619.

[14] 81 *Federal Register* 156: 53395-53396, August 12, 2016; also DEA/USDA/FDA joint "Statement of Principles on Industrial Hemp," August 2016.

[15] DEA, "DEA Internal Directive Regarding the Presence of Cannabinoids in Products and Materials Made from the Cannabis Plant," May 22, 2018.

[16] 81 *Federal Register* 240: 90194-90196, December 14, 2016. See also DEA, "Clarification of the New Drug Code (7350) for Marijuana Extract," https://www.deadiversion.usdoj.gov/schedules/marijuana/m_extract_7350.html.

[17] P.L. 115-334, §12619(a).

[18] P.L. 115-334, §12619(b).

containing cannabidiol (CBD) or other cannabinoids, as well as any products making therapeutic claims without FDA approval.[19]

The 2018 farm bill also established a new regulatory framework to monitor compliance and regulate production under USDA's jurisdiction.[20] The 2018 farm bill also contains an "interstate commerce" provision that prohibits states and Indian tribes from interfering with the transport of hemp or hemp products produced in accordance with the new USDA requirements through their jurisdictions.[21] Hemp is now also eligible for federal crop insurance programs, as well as USDA research and development programs.[22] These changes returned U.S. hemp production to the status of an agricultural commodity and thus eligible for USDA-supported farm programs, similar to the status it had in the United States before the late 1950s.

Chemical and Genetic Makeup

There are many different varieties of cannabis. Although industrial hemp and marijuana are both varieties of cannabis, they have been bred for different uses and can be distinguished by their chemical and genetic compositions.[23]

Differences in Chemical Composition

The term *industrial hemp* dates back to the 1960s and generally refers to cannabis varieties that are grown primarily as an agricultural crop, such as seeds and fiber, and byproducts, such as oil, seed cake, and hurds.[24] Hemp is generally characterized by plants that are low in delta-9 THC, the dominant psychotrophic compound in *Cannabis sativa*.[25] In addition to its low THC content, hemp generally has high levels of CBD, the primary nonpsychotropic compound in *Cannabis sativa*.[26] Accordingly, a high ratio of CBD to THC might also be a metric used to differentiate hemp from other cannabis varieties.[27]

[19] FDA, "Statement from FDA Commissioner Scott Gottlieb, M.D., on the Signing of the Agriculture Improvement Act and the Agency's Regulation of Products Containing Cannabis and Cannabis-Derived Compounds," press release, December 20, 2018.

[20] P.L. 115-334, §10114.

[21] P.L. 115-334, §10113.

[22] For more information, see CRS In Focus IF11088, *2018 Farm Bill Primer: Hemp Cultivation and Processing*.

[23] See, for example, S. L. Datwyler and G. D. Weiblen, "Genetic Variation in Hemp and Marijuana (*Cannabis sativa* L.) According to Amplified Fragment Length Polymorphisms," *Journal of Forensic Sciences*, vol. 51, no. 2 (2006).

[24] See L. Grlic, "A Combined Spectrophotometric Differentiation of Samples of Cannabis," United Nations Office on Drugs and Crime, January 1968. Hurds are soft inner core fiber of the hemp stalk. Hurds are woody in texture and mostly used in nonwoven items, including hempcrete and animal bedding.

[25] R. C. Clarke and M. D. Merlin, *Cannabis: Evolution and Ethnobotany* (University of California Press, 2013), p. 255. A psychotrophic drug is capable of affecting mental activity, behavior, or perception and may be mood-altering.

[26] U. R. Avico et al., "Variations of Tetrahydrocannabinol Content in Cannabis Plants to Distinguish the Fibre-Type from Drug-Type Plants," *UNODC Bulletin on Narcotics*, January 1985; C. W. Waller, "Chemistry of Marihuana," *Pharmacological Reviews*, vol. 23 (December 1971); K. W. Hillig and P. G. Mahlberg, "A Chemotaxonomic Analysis of Cannabinoid Variation in Cannabis (Cannabaceae)," *American Journal of Botany*, vol. 91, no. 6 (June 2004); and A. W. Zuardi et al., "Cannabidiol, a Cannabis sativa Constituent, as an Antipsychotic Drug," *Brazilian Journal of Medical and Biological Research*, vol. 39 (2006).

[27] Continued advancement in breeding and plant genetics, however, are resulting in cannabis varieties or cultivars that have more equal parts THC and CBD, making previous generalizations about the inverse relationship between THC and CBD concentration less relevant.

THC and CBD are among the subclasses of cannabinoids and their 66 known variants in *Cannabis sativa* (see **text box**).[28] *Cannabinoids* refer to the unique chemical compounds produced in the plant, which are known to exhibit a range of psychological and physiological effects.[29] These compounds exist in both hemp and marijuana in varying amounts. THC is the primary psychoactive compound in cannabis; however, the plant contains multiple THC isomers and variants.[30] While some cannabinoids are psychoactive, others, such as CBD, are not considered to be psychoactive.[31] THC and CBD are considered to be among the most abundant cannabinoids in cannabis, and some consider both to be medically valuable. THC and CBD are also the most well-known and researched cannabinoids. Among the isomers of THC, properties may vary and not all have been well characterized.[32] The interaction between THC and other cannabinoids in the cannabis plant is also not well known.

Cannabinoids

More than 480 natural components are found within the *Cannabis sativa* plant, of which 66 are classified as cannabinoids. Cannabinoids are separated into the following subclasses.

Delta-9 tetrahydrocannabinol (delta-9 THC)	Number of known variants: 9
Delta-8 tetrahydrocannabinol (delta-8 THC)	Number of known variants: 2
Cannabigerol (CBG)	Number of known variants: 6
Cannabichromene (CBC)	Number of known variants: 5
Cannabidiol (CBD)	Number of known variants: 7
Cannabinol (CBN)	Number of known variants: 7
Cannabinodiol (CBND or CBDL)	Number of known variants: 2
Cannabicyclol (CBL)	Number of known variants: 3
Cannabielsoin (CBE)	Number of known variants: 5
Cannabitriol (CBT)	Number of known variants: 9
Other miscellaneous types of cannabinoids	Number of known variants: 11

Source: J. E. Joy et al., eds., *Marijuana and Medicine: Assessing the Science Base*, Institute of Medicine, 1999; and University of Washington, Alcohol and Drug Abuse Institute, "Cannabinoids," June 2013.

[28] More than 540 phytochemicals have been described in hemp (see J. Gould, "The Cannabis Crop," *Nature*, vol. 525, no. S2–S3 [September 24, 2015]). Other present compounds include certain terpenes and phenolic compounds, including flavonoids. See footnote 49.

[29] Clarke and Merlin, *Cannabis: Evolution and Ethnobotany*, p. 255.

[30] Isomers are molecules with the same chemical formula but distinct atomic structures.

[31] Clarke and Merlin, *Cannabis: Evolution and Ethnobotany*. For example, cannabigerol, cannabichromene, and cannabidivarin are reported to be nonpsychotrophic.

[32] See, for example, E. A. Carlini, "The Good and the Bad Effects of (-) Trans-Delta-9-Tetrahydrocannabinol (Δ9-THC) on Humans," *Toxicon*, vol. 44 (July 2004), pp. 461-467. Other identified isomers of THC, such as delta-1 THC and delta-6 THC, may be related to delta-9 THC and delta-8 THC, respectively.

Differences in Genetic Composition

Scientific and genome research indicate that hemp and marijuana are neither genetically identical nor genetically similar. Although hemp and marijuana are from the same cannabis plant, available research supports the conclusion that selective breeding has resulted in two separate strains.

A 2015 study by Canadian researchers reports that "marijuana and hemp are significantly differentiated at a genome-wide level, demonstrating that the distinction between these populations is not limited to genes underlying THC production."[33]

A 2015 University of Minnesota study notes that marijuana and hemp "can be readily distinguished by the relative yield" of tetrahydrocannabinolic acid (THCA) in marijuana and cannabidiolic acid (CBDA) in hemp.[34] The study observed a "diversity of THCA and CBDA synthase sequences observed in the mapping population, the position of enzyme coding loci on the map, and patterns of expression suggest multiple linked loci." The study also found that marijuana is distinguished from hemp by compounds that appear to have been "positively selected to enhance psychoactivity."[35]

The discovery of a single gene distinguishing two plant varieties suggests that the two plants are distinct. A 2011 Canadian study further concluded that "single nucleotide variant analysis uncovered a relatively high level of variation among four cannabis types, and supported a separation of marijuana and hemp."[36] These studies find that available research and genome mapping suggest that hemp and marijuana are genetically separate and distinct plant varieties.

Genomic research in Canada supports the notion that over thousands of years of cultivation, cannabis farmers have "selectively bred *Cannabis sativa* into two distinct strains—one for fiber and seed, and one for medicine."[37]

Production Practices and Use

In general, hemp is grown and harvested differently from marijuana. Production practices among cannabis varieties vary with respect to cultivation, including plant height, density, and timing of their harvest. While marijuana is cultivated to promote the development of flowering tops and leaves of psychoactive cannabis plant varieties with elevated concentrations of THC, hemp is cultivated depending on its intended use across three different crops: fiber, seeds, and flower (**Table 1**).

[33] J. Sawler et al., "The Genetic Structure of Marijuana and Hemp," August 2015, PLoS ONE, vol. 10, no. 8, https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0133292.

[34] G. D. Weiblen et al., "Gene Duplication and Divergence Affecting Drug Content in Cannabis Sativa," *New Phytologist*, July 17, 2015, https://doi.org/10.1111/nph.13562.

[35] Weiblen et al., "Gene Duplication and Divergence."

[36] H. van Bakel et al., "The Draft Genome and Transcriptome of Cannabis Sativa,'" *Genome Biology*, vol. 12, no. 10 (October 20, 2011), https://doi.org/10.1186/gb-2011-12-10-r102.

[37] *ScienceDaily*, "How Hemp Got High: Cannabis Genome Mapped," October 24, 2011, citing vanBakel et al., "The Draft Genome and Transcriptome of *Cannabis Sativa*."

Table 1. Primary Hemp Crops: Fiber, Seeds, and Flowers

	Fiber	Seed/Grains	Flower
Desired Plant Material	Stalks (bast fibers and hurd/core fibers)	Dried (high in oil and protein)	Dried and cut (flower bud and floral material)
Planting Density	Dense spacing to discourage branching and flowering (35-50 plants/ft^2)	Dense spacing to discourage branching and flowering (35-50 plants/ft^2)	Well spaced (typically planted 3-4 feet apart on a 3-5 foot center)
Physical Characteristics	Tall plants with small stalks and less leafy material	Plants with small stalks and less leafy material	Bushy plant with wide branching to promote flowers/buds (selecting female plants is ideal)
Harvest Height	10-15 feet	6-9 feet	4-8 feet
Harvesting Considerations	Typically using hay equipment (mow, field retting 2-3 weeks, then roll balling)	Must be harvested within a short window due to seed scatter issues	Harvesting is highly labor intensive, in part given possible degradation of plant material related to efforts to preserve the chemical properties of the plant's flowering heads; also requires drying down to 10% moisture
Yields	1.0-5.5 tons per acre of dry matter (whole dry stems)	Avg: 800-1,000 lbs./acre (up to 1,600 lbs./acres)	NA (varies widely); one plant yields about one pound of dried material
Price (2017)	$70-$135 per ton	$0.65-$0.75 per pound	$25-$200 per pound
Forward Contracting	About 8¢/lb. ($160/ton).	NA	NA
Return per Acre	Up to $700 per acre	Up to $1,200 per acre	NA
Common Uses	Bast fibers used for paper, insulation, composites, and textiles; core fibers used for animal bedding, concrete, fiberboard, and oil absorbents	Foods and body products Shelled seed and fines Oil and seed cake	Extractions of plant resin (CBD, other cannabinoids) Nutraceuticals and wellness products
Postproduction Process	Decortication, removing the tough woody interior (hurd) from the softer, fibrous exterior of the stalk (separating the bast and the hurd/core fibers)	Dehulling and pressing of dried hemp seed/grains	Requires extraction using a variety of methods, including lipid or alcohol/ethanol infusions, CO_2 extraction, or extraction using other types of chemical solvents (hexane, butane), as well as solvent-free extractions; extraction may or may not involve heat decarboxylation

Source: CRS from various sources, including K. Pularski, "Hemp Industry Overview," presentation at hemp conference hosted by the Greater Peoria Economic Development Council, Illinois, January 18, 2019.

Notes: Most figures are based on 2017 Kentucky crop data. Production data for other producing regions may vary. NA = Not available.

Cannabis is dioecious, meaning that there are separate male and female plants, each with distinctive growth characteristics. For drug production, the female flowers are more valuable, whereas male plants are used to produce hemp fibers. When cannabis is grown to produce marijuana, it is cultivated from varieties where the female flowers are specifically selected to prevent the return of separate male and female plants.[38] When cultivating marijuana, the female

[38] Van Bakel et al., "The Draft Genome and Transcriptome of *Cannabis Sativa*." In botany, *dioecious* describes plant varieties that possess male and female flowers or other reproductive organs on separate, individual plants.

flowers are short and tightly clustered. In marijuana cultivation, growers remove all the male plants to prevent pollination and seed set. Some growers will hand-pollinate a female plant to get seed. This is done in isolation from the rest of the female plants. Encouraging monoecism (female-only plants) in marijuana cultivation requires the skill of a competent plant breeder and rarely occurs under noncultivated conditions. By contrast, when cannabis is grown to produce hemp fiber and seeds (using only male plants), the plant is discouraged from flowering, forcing it to grow taller with less branching.

Cannabis seeds generally fall into one of three categories: regular, feminized, or autoflowering.[39] Regular seeds produce both male and female plants at about a 50/50 ratio, but often male plants may be identified to avoid the fertilization of the female plants. Feminized seeds are specially treated plants to produce only female plants, generally by stressing a female plant to produce viable, genetically identical seeds without being fertilized by a male plant, resulting in female offspring only. Autoflowering seeds are crossbred hybrids that generally result in all female plants that often contain less THC.[40] Some seeds are being genetically and/or selectively bred to produce strains that have zero THC.[41]

Preserving the genetic composition of each variety requires careful attention to the prevention of cross-pollination. Cross-pollination among the different varieties is a concern because cannabis plants are open (e.g., wind and/or insect pollinated), and thus cross-pollination is possible if the crops are grown in close proximity. Cross-pollination would result in unwanted characteristics in both industrial hemp and marijuana. For growers of marijuana, cross-pollination with hemp could significantly lower the THC content and thus degrade the value of the marijuana crop. Likewise, growers of hemp would seek to avoid cross-pollination with marijuana plants, especially given the illegal status of marijuana. If hemp varieties are grown in or around marijuana, the hemp would pollinate the female marijuana plant. Likewise, marijuana growers would not want to plant near hemp fields, because this could result in harvests that are seedy and lower in THC and thus degrade the value of their marijuana crops. Plants grown for oilseed are also marketed according to the purity of the oilseed, and the mixing of other genotypes would degrade the value of the crop.[42]

Differences in the cultivation practices between marijuana and hemp generally result in different observable traits under field conditions.[43] Visual plant differences between hemp and marijuana generally include **plant height** (hemp is often encouraged to grow tall, whereas marijuana is selected to grow short and tightly clustered); **cultivation** (hemp is often grown as a single main stalk with few leaves and branches, whereas marijuana is encouraged to become bushy with many leaves and branches to promote flowers and buds); and **planting density** (hemp is often densely planted to discourage branching and flowering, whereas marijuana plants are well spaced).

[39] I. Zeiler and C. Bussink, "The Cannabis Seeds Business," draft report by researchers at the United Nations Office on Drugs and Crime, 2012.

[40] Zeiler and Bussink, "The Cannabis Seeds Business."

[41] See, for example, *BusinessWire*, "GenCanna Announces First Patentable Non-GMO Hemp Genetics with 0.0% THC," January 28, 2019.

[42] An example of another plant whereby different crops are cultivated by selecting for different traits is sweet corn and field corn (or corn for grain). Corn may also naturally cross-pollinate and requires early selection and removal of plants before pollination based on certain plant traits. Intermixing plants of the two types of corn may result in cross-pollination and degradation of each crop.

[43] G. D. Weiblen, University of Minnesota, presentation at the 2013 Annual HIA Conference, Washington, DC, November 17, 2013.

In general, the period of seeding to harvest ranges from 70 to 140 days depending on its intended purpose, the cultivar or variety planted, and climatic conditions. Different cannabis varieties or cultivars may be harvested at different times depending on the growing area.

Recent advances in cannabis research and development, as well as plant breeding and the creation of new cultivars and hybrids, are resulting in plants that do not always precisely present these distinctive observable characteristics.[44] Specifically, some hemp plants are being grown to be short and bushy, encouraging larger flowers, often from high-CBD, low-THC hemp seed. Hemp plants grown for flower are planted less densely—about 3 to 5 feet apart—to encourage the plant to become bushy with many leaves with wide branching to promote flowers and buds. Similarly, marijuana's high THC content is concentrated primarily in the flowers and to a lesser extent in the leaves.

The cannabis plant's cannabinoids (e.g., CBD, THC) are generally concentrated not in the plant's seeds but in the flowering head of the plant.[45] Specifically, the heads of the mature cannabis flowers and leaves contain the trichomes—a term that refers to the small resin-like hairs/glands of the flowering buds but may also cover the leaves, bracts, and stems of plants.[46] Trichomes—the plant hairs—are among the primary source of the plant's cannabinoids. Cannabinoids may be present in other parts of the plant, including the seeds, but in lower quantities.[47] Cannabinoid concentration in hemp may also vary depending on the types of trichomes and secretory structures present.[48] Besides cannabinoids, cannabis trichomes produce other secondary metabolites, including terpenes and certain phenolic compounds, such as flavonoids.[49]

In general, each cannabis plant yields approximately one pound of dried floral material available for extraction by chemical process (**Table 1**). However, the percentage of extract generated per pound of dried material, as well as the quality and level of cannabinoids extracted, varies widely. Still, the flowers of the hemp and marijuana plant differ. Drug-grade cannabis also contains high resin concentrations, whereas fiber-grade cannabis generally has low levels of resin.

Hemp plants grown for fiber or oilseed are planted more densely—about 35-50 plants per square foot to discourage branching and flowering—than hemp plants grown for flower. For fiber and oilseed, the plant's stalk and seed are the harvested products.[50] Available 2017 production statistics for Kentucky indicate that 1 acre of hemp yields between 800 and 1,000 pounds of seed, or between 1 and more than 5 tons of dry matter (**Table 1**).[51]

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[44] CRS communication with Duane Sinning, Colorado Department of Agriculture, February 2, 2016.

[45] J. E. Joy et al., eds., *Marijuana and Medicine: Assessing the Science Base*, Institute of Medicine, 1999.

[46] C. M. Andre et al., "*Cannabis sativa*: The Plant of the Thousand and One Molecules," *Frontiers in Plant Science*, vol. 7, no. 19 (2016).

[47] See, for example, S. A. Ross et al., "GC-MS Analysis of the Total Delta9-THC Content of Both Drug- and Fiber-Type Cannabis Seeds," *Journal of Analytical Toxicology*, vol. 24, no. 8 (November-December 2000), pp. 715-717.

[48] Hemp trichome types include unicellular nonglandular trichome, cystolythic trichomes, capitate sessile trichome, capitate-stalked trichome, simple bulbous trichome, and complex bulbous trichome.

[49] Ross et al., "GC-MS Analysis." *Terpenes* refers to certain phytochemicals (or biologically active compounds) found in plants, generally associated with a plant's aromatic organic compounds. *Phenolic compounds* refers to a large class of secondary metabolites found in most plants.

[50] The stalk provides two types of fibers: (1) the interior or core short woody fibers (or hurds) and (2) the outer portion of the stem, which contains the long bast fibers (referring to the cellulosic fibers that grow on the outside of the hemp plant's stalk, which are used for animal bedding and oil absorbents, among other uses).

[51] Previous estimates from Agriculture and Agri-Food Canada suggest that about 700 pounds of seed can be pressed into about 50 gallons of oil and 530 pounds of meal, whereas 5,300 pounds of hemp straw can be transformed into about 1,300 pounds of fiber.

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