

Farmers' Guide to GMOs



**By David R. Moeller - Farmers' Legal Action Group, Inc. (FLAG) and
Michael Sligh - Rural Advancement Foundation International - USA (RAFI-USA)**

Edited by Karen R. Krub - FLAG

November 2004

PUBLISHED BY

Farmers' Legal Action Group, Inc.
360 North Robert Street, Suite 500
St. Paul, Minnesota 55101
lawyers@flaginc.org
www.flaginc.org

Rural Advancement Foundation International – USA
PO Box 640
274 Pittsboro Elementary School Road
Pittsboro, NC 27312
www.rafiusa.org

Text ©2004, Farmers' Legal Action Group, Inc. and Rural Advancement Foundation International-USA.

This book may be reprinted for educational purposes only so long as FLAG and RAFI-USA are credited when reprinting.

Cover photo courtesy of Rob Amberg.

ISBN: from FLAG – 1-890508-07-1
From RAFI – 0-9754230-3-7

Table of Contents

| | |
|---|----|
| Acknowledgements..... | 3 |
| About FLAG (www.flaginc.org) | 3 |
| About RAFI-USA (www.rafiusa.org)..... | 3 |
| FARMERS’ CHECKLIST TO GMO CONTRACTS* (see contracts for details)..... | 5 |
| FARMERS’ CHECKLIST TO TECHNOLOGY AGREEMENT LICENSEE KNOCKING ON YOUR DOOR..... | 6 |
| Executive Summary | 7 |
| I. Introduction | 8 |
| II. Federal Regulation of GMOs | 8 |
| A. USDA..... | 9 |
| B. EPA | 9 |
| C. FDA..... | 9 |
| III. GMO Contracts..... | 10 |
| A. Seed Use..... | 11 |
| B. Access to Records and Enforcement of Contracts | 11 |
| C. EPA Field Inspections..... | 12 |
| D. Marketing and Channeling Grain..... | 13 |
| E. GMO Seed Warranties and Generic Inputs | 14 |
| F. Governing Law and Forum Selection Clauses | 15 |
| G. Monsanto’s Remedies Under Its Technology Agreement | 17 |
| IV. Can Farmers Save Seed? | 17 |
| A. Growing GMOs and Saving Seed..... | 18 |
| B. GMO Contamination and Saving Seed | 18 |
| V. What To Do When Monsanto or Other Such Licensee Companies Are Knocking on Your Door | 20 |
| VI. What Liability Issues Do Farmers Face When GMO Contamination Occurs?..... | 21 |
| A. Trespass to Land | 22 |

| | |
|--|----|
| B. Nuisance..... | 22 |
| C. Negligence..... | 23 |
| D. Strict Liability | 23 |
| VII. How Farmers Can Protect Themselves From GMO Contamination | 24 |
| A. Seed Selection..... | 24 |
| B. Identity Preserved Contracts | 24 |
| C. Production Methods | 25 |
| VIII. International Issues | 27 |
| IX. GMO Costs and Benefits | 28 |
| Resources | 30 |
| 2005 MONSANTO TECHNOLOGY/STEWARDSHIP AGREEMENT | 34 |
| NOTES..... | 38 |

Acknowledgements

Farmers' Legal Action Group, Inc. (FLAG) and Rural Advancement Foundation International-USA (RAFI-USA) wish to thank the Nathan Cummings Foundation, the Lawson Valentine Foundation, and The John Merck Foundation for their support of FLAG's and RAFI-USA's work on genetically modified organisms (GMOs) issues, and the Minneapolis Foundation, Farm Aid, and the Education Foundation of America for general support.

FLAG and RAFI-USA appreciate the technical reviewers of the draft guide, who made many valuable comments at various stages in the process. Reviewers include Christy Anderson Brekken, David Grant, Margaret Rosso Grossman, Neil Harl, John Justice, Jill Krueger, Joe Mendelson, Thom Petersen, Theresa Podell, John Smillie, Don Uchtmann, Sarah Vogel, and Bill Wenzel. We greatly appreciate the many individuals and colleagues who supplied information for this guide. This guide is the sole responsibility of FLAG and RAFI-USA. While the assistance received from those acknowledged has been invaluable, they are in no way responsible for its content.

About FLAG (www.flaginc.org)

Founded in 1986, FLAG is a nonprofit law center dedicated to providing legal services to family farmers and their rural communities in order to help keep family farmers on the land.

America needs an agriculture that supports healthy rural communities, protects the environment, and promotes a safe, diverse, and stable food supply. To achieve these goals, America needs a healthy family farm-based system of agriculture. Targeted, top-notch legal information and advocacy are indispensable in the struggle to defend family-based agriculture and secure social and economic justice for farmers. FLAG exists to provide those legal services.

About RAFI-USA (www.rafiusa.org)

RAFI-USA is dedicated to community, equity, and diversity in agriculture. While focusing on North Carolina and the southeastern United States, RAFI-USA also works nationally and internationally. RAFI-USA traces its heritage to the National Sharecroppers' Fund, which was founded in the 1930s and led by Dr. Frank Porter Graham, Eleanor Roosevelt, and other distinguished Americans. Its small but seasoned staff has been together for more than a decade. RAFI-USA's programs address the trends and changes in agriculture that affect us from the local to the global levels. Working with a variety of farm, community, university, and government groups, RAFI-USA promotes sustainability, equity, and diversity in agriculture through policy changes, practical assistance, market opportunities, and access to financial and technical resources.

For more than 10,000 years, farmers have worked with the environment to create new plants, fiber, and food to sustain life all over the earth. As we lose farmers, we lose diversity. As we lose diversity, we lose farmers. The social, economic, and technological changes converging on our rural communities are rapidly changing how food is produced and what comes to our tables. RAFI-USA believes that farmers and consumers must be

informed, involved with each other, and active in protecting and directing the use of natural and human agricultural resources.

FARMERS' CHECKLIST TO GMO CONTRACTS* (see contracts for details)

- ❑ Farmers have no opportunity or rights to negotiate the terms of the (TA), Technology Agreement which they are required to sign. – see pg. 10 and contract for details
- ❑ Farmers accept all the terms and responsibilities of the TA by signing the contract OR BY OPENING THE BAG! – pg. 10
- ❑ Farmers may be required to settle all legal disputes concerning Monsanto in St. Louis, Missouri (Monsanto's Headquarters). – pg. 16
- ❑ Farmers signing this agreement have agreed to have all of their rights under the Federal Privacy Act waived. – pg. 12
- ❑ Farmers can not save any seed or provide any seeds to others. – pg. 11
- ❑ Farmers must allow Monsanto access to their fields to inspect crops and to determine the farmer's compliance with the contract. – pg. 12
- ❑ Farmers must allow Monsanto full access to their records including USDA, FSA, Risk Management Agency (RMA), and invoices for all seed and chemical transactions and allow Monsanto to copy any relevant receipts and documents. – pp. 11-12
- ❑ There is no "sunset" or time limit to this contract – Monsanto can review a farmer's documents, fields and crops even after the farmer has stopped growing Monsanto seeds. – pg. 12
- ❑ Farmers accept **all liability and responsibility** for keeping GM crops out of markets, elevators or other farmers' fields that do not want or allow GM crops. – pg. 13
- ❑ Monsanto will not honor any warranties if the farmer does not also use Monsanto approved chemicals with Monsanto GM seeds. – pg. 14
- ❑ If the farmer is unhappy with the performance of the seeds – they are only entitled to Monsanto choice of replacement of the seed or reimbursement of price paid by the farmer for the seed quantities involved. – pg. 15
- ❑ Only the laws of Missouri (Monsanto's Headquarters) apply to farmers who go to court against Monsanto, NOT the laws of the state in which the farmer lives. – pg. 15
- ❑ If the farmer buys Monsanto cotton seed all disputes will be resolved through binding arbitration. – pg. 16
- ❑ If the farmers are caught violating the contract – Monsanto will seek to collect damages and attorneys' fees and costs from farmers. – pg. 17

FARMERS' CHECKLIST TO TECHNOLOGY AGREEMENT LICENSEE KNOCKING ON YOUR DOOR

- ❑ Did the farmer sign a technology agreement? Signing a technology agreement gives Monsanto and other Licensee's specified rights to access your property and records. – pg. 20
- ❑ What is Licensee's justification for why they are asking the farmer to take samples? – pg. 20
- ❑ If Licensee demands sample be taken, the farmer should make sure separate, independent samples are also taken. – pg. 20
- ❑ If Licensee claims a patent infringement, the farmer should compare those results with separate independent tests. – pg. 20
- ❑ If Licensee still claims a patent infringement, the farmer should find an attorney. – pg. 20
- ❑ The farmer should also preserve all records and seed bags that show seed and chemical purchases that may clear the farmer in court. – pg. 21

Executive Summary

For nearly a decade, US farmers have commercially grown genetically modified organisms, or GMOs. Whether farmers grow GMOs or conventional seeds, or are certified organic, the use of GMOs in commercial agriculture will affect their operations. This *Farmers' Guide to GMOs* addresses some of the many issues that are associated with farmers' use of GMOs. While this Guide is designed for US farmers, it is our hope that the information provided can be illustrative to farmers worldwide.

The introductory section of this guide sets out recent statistics on the commercial production of genetically modified (GM) crops by American farmers and the concentration of GMO development and marketing by a few biotechnology companies. Section II discusses the regulation of GMOs by three federal agencies: the United States Department of Agriculture, the Environmental Protection Agency and the Food and Drug Administration. Section III looks at the obligations and legal limitations farmers assume when they sign GMO contracts, such as Monsanto's Technology Agreement. Common obligations include giving up the right to save seed, opening their fields up to inspections by the company, and agreeing that the company will be entitled to specified remedies if the farmer violates the agreement. Under these contracts farmers typically also agree to a limit on the warranties available for the GM seed and a limit on where they can sue or otherwise seek resolution of a dispute with the company.

In Section IV, the guide analyzes farmers' right to save seed in light of a recent U.S. Supreme Court case that limited a statutory saving seed exemption and a Canadian case involving seed saving from a crop contaminated with GMO technology. In Section V, the guide provides information on the steps farmers should consider taking if they are accused of violating a biotechnology company's seed patent. Potential issues of liability for farmers from GMO contamination are addressed in Section VI. This raises one of the primary GMO-related problems for farmers: in a world of widespread production of GM crops, what one farmer plants may seriously affect all of the farmer's neighbors' crops. Steps farmers might take to protect themselves from GMO contamination are the subject of Section VII. Section VIII addresses some of the current international issues related to GMOs. Finally, Section IX summarizes recent research on the costs and benefits of GMOs.

The guide also includes a list of resources to explore for further information on many GMO issues and a reproduction of the legal sections from Monsanto's 2005 Technology Agreement.

I. Introduction

This guide is a tool to assist farmers in understanding genetically modified organisms or GMOs. This guide addresses those impacts by providing farmers information on

- Federal regulation of GMOs
- GMO contract terms
- Seed saving
- Field inspections
- Liability issues from GMO contamination
- Limiting the risk of contamination and liability
- International issues
- GMO costs and benefits

GMOs in agriculture are products resulting from the use of recombinant DNA technology to alter the genetic sequence of a plant to force the plant to express a desired trait. The two most common GMO traits on the market are herbicide tolerance, such as is found in Roundup Ready seed, and incorporation of an insecticide directly into the plant, such as Bt (*Bacillus thuringiensis*). In 2003, GMOs were used by American farmers for at least 81 percent of their soybeans, 40 percent of field corn, and 73 percent of upland cotton.¹ New GM products in the pipeline include GM alfalfa² and GM rice.³ These and other GM products are being developed and tested at public land grant institutions and private companies across the United States. Also, biotechnology companies are beginning to contract with farmers to grow biopharmaceutical GMOs that express traits that can be used for industrial chemicals, drugs, and vaccines.⁴

The vast majority of GMOs are developed, manufactured, and marketed by a select number of agribusiness companies. These companies, including Monsanto, DuPont, Syngenta, and Aventis, control the bulk of GMO technology and the resulting seed and chemical markets.⁵ In 1998, Monsanto controlled 70 percent of the GM soybean market,⁶ and all reports indicate this percentage has risen since then. For these companies, the GMO market is more than selling seed to farmers each year; it is a whole package of chemical inputs that are either applied by the farmer or expressed within the GMO.⁷

II. Federal Regulation of GMOs

Federal regulation of GMOs involves primarily three federal agencies: the United States Department of Agriculture (USDA), the Environmental Protection Agency (EPA), and the Food and Drug Administration (FDA).⁸ Each agency has regulatory authority over different parts of GMO development, production, and marketing.⁹ Sometimes these agencies' authorities overlap, and sometimes there are gaps in federal regulatory authority, including regulation of what happens after GMOs are marketed.¹⁰

A. USDA

USDA regulates pre-release field testing and procedures for GMOs, including field trials of GM crops. The Animal and Plant Health Inspection Service (APHIS) is the agency within USDA responsible for evaluating the environmental impacts of these GMO field trials. APHIS's authority to regulate GMOs stems from the Plant Protection Act (PPA).¹¹ This law and implementing regulations govern the release of plant pests into the environment.¹² Prior to using field trials, biotech companies must either notify APHIS of the field trial or obtain a permit.¹³ Companies that want to market their GMO products to farmers must petition APHIS, asking that the GMO no longer be regulated.¹⁴ The petition must include data showing that the GMO should not be considered a plant pest and information regarding any potential impacts the GMO may have on the environment.¹⁵ Once the petition is approved, the GMO is no longer subject to APHIS regulations as a plant pest, and the company is free to market and sell the GMO to farmers.¹⁶

According to a Pew Initiative report, after deregulation:

Under the PPA, [a crop] can be brought back within the regulatory control of APHIS if the agency determines that the crop is a plant pest or noxious weed, presumably on the basis of new information brought to the agency's attention by the developer, a petitioner, or new analysis. APHIS, however, has no systematic program in place for monitoring plants after they are deregulated.¹⁷

Thus, once APHIS allows a GM crop to be deregulated and therefore commercialized, the extent of the agency's regulatory authority significantly diminishes.

B. EPA

EPA has authority to regulate pesticides under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA).¹⁸ Under this authority, EPA regulates pesticides contained within GMOs, what EPA calls "plant-incorporated protectants" (PIPs).¹⁹ For example, EPA regulates GMOs that contain Bt because Bt is a pesticide.²⁰ Under FIFRA, EPA regulates GMOs containing pesticides to ensure that they do not harm the environment.²¹ It does this by requiring GMO developers obtain a registration of their pesticide-containing products prior to commercial release.²² EPA is supposed to determine that a pesticide is not "unreasonably" harmful to the environment before approving a registration.²³

EPA also sets tolerance levels for pesticides that will end up as residues in foods.²⁴ If the chemical residue exceeds these tolerance levels, the food is considered not safe for consumption under the Federal Food, Drug, and Cosmetic Act.²⁵ Since some foods produced with GMOs have pesticides incorporated into them, the pesticide level must be within these residue limits set by EPA. In practice EPA almost always issues exemptions from pesticide tolerance.²⁶

C. FDA

FDA has regulatory authority over food produced from GMOs.²⁷ Generally, FDA treats GM foods the same way it does non-GM foods, though a recent study commission by the U.S. government recommended that GM foods should be evaluated on a case by case basis.²⁸ Since 1992, FDA has claimed that each GM food that has been brought to its

attention is “generally recognized as safe” (GRAS) and therefore further premarket regulation or independent safety testing of the food is not required.²⁹ In 2001, FDA proposed requiring that companies provide pre-market notification for new GM foods³⁰ and proposed a voluntary guidance for labeling GM foods.³¹ FDA has not finalized these proposals nor taken other steps to test the safety of GM foods independently.³²

III. GMO Contracts

To maintain control over GMOs, biotechnology companies and seed companies require farmers to sign grower or technology agreements.³³ These agreements generally give the farmer rights to use, or “license,” the GM seed in exchange for complying with all of the company’s production methods and management requirements.³⁴ For example, Monsanto requires that farmers using its GM seeds sign an annual Technology Agreement/Stewardship Agreement (Technology Agreement). By signing the Technology Agreement, farmers also agree to abide by the Technology Use Guide’s (TUG) requirements and guidelines for using Monsanto’s products.³⁵ The farmer will not get an opportunity to negotiate the terms of the Technology Agreement, which is offered on a take-it-or-leave-it basis as part of the seed purchase.³⁶

Farmers may also be bound by the terms of Monsanto’s Technology Agreement simply by opening and using a bag of seed containing Monsanto technology. Monsanto’s Technology Agreement states:

Grower accepts the terms of the following NOTICE REQUIREMENT, LIMITED WARRANTY AND DISCLAIMER OF WARRANTY AND EXCLUSIVE LIMITED REMEDY by signing this Agreement and/or opening a bag of seed containing Monsanto Technology. If Grower does not agree to be bound by the conditions of purchase or use, Grower agrees to return the unopened bags to Grower’s seed dealer.³⁷

One court held that a farmer illegally saved Roundup Ready soybean seed—even though the farmer did not sign a Technology Agreement for the two growing seasons in dispute—because he did open and plant some bags of the seed.³⁸ The bottom line is that farmers who use GMOs, even if they do not sign a contract, may be bound by the terms of the biotechnology companies’ contracts.

The companies generally use these agreements to secure a number of protections for themselves.³⁹ Under a GM seed contract, farmers typically agree to follow specific guidelines about where and how to plant the GM seed, refrain from saving seed from the crop produced from the purchased seed, protect the company’s intellectual property rights, sell the commodity in specified, approved markets, and resolve any disputes arising under the contract either through binding arbitration or in a court convenient to the company.⁴⁰ The contract may also require the farmer to allow company representatives access to fields to inspect crops and determine if the farmer is in compliance with the contract.

A. Seed Use

Monsanto's 2005 Technology Agreement contains a number of provisions related to the use of seed by farmers. Farmers who sign this contract agree to follow many limits including⁴¹:

- “To use the seed containing Monsanto Technologies solely for planting a single commercial crop.”
- “Not to supply any Seed containing patented Monsanto Technologies to any other person or entity for planting. Not to save any crop produced from Seed for planting and not to supply Seed produced from Seed to anyone for planting.”
- “Not to use or to allow others to use Seed containing patented Monsanto Technologies for crop breeding, research, generation of herbicide registration data, or Seed production (unless Grower has entered into a valid, written production agreement with a licensed seed company).”
- “To acquire Seed containing these Monsanto Technologies only from a seed company with required technology license(s) from Monsanto or a licensed company's authorized dealer.”
- “To pay the technology fees due to Monsanto that are a part of or collected with the Seed purchase price.”

By requiring that farmers use Monsanto patented technology if they are acquired from a license only for a single growing season and not save any of the crop seed, Monsanto is ensuring that farmers purchase new seed with these patented traits each crop year, most likely from Monsanto. The restrictions on the use of Monsanto's products for crop breeding and research mean that any new developments in these products will only come from Monsanto and not through public breeding programs or farmer innovation. As shown in Section IV, Monsanto has had success enforcing its Technology Agreement provision that prohibits farmers from saving their seed, despite legal challenges.

B. Access to Records and Enforcement of Contracts

Monsanto and other biotechnology companies enforce their technology agreements through multiple methods, including inspecting and auditing farmers' files. Monsanto's Technology Agreement provides that the farmer agrees to

[u]pon written request, to allow Monsanto to review the [USDA's] Farm Service Agency crop reporting information on any land farmed by Grower including Summary Acreage History Report, Form 578 and corresponding aerial photographs, [USDA's] Risk Management Agency claim documentation, and dealer/retailer invoices for your seed and chemical transactions.

In addition to these specific documents, Monsanto also requires the farmer to agree to

allow Monsanto to examine and copy any records and receipts that could be relevant to Grower's performance of this Agreement.⁴²

There is no time limit in the Technology Agreement, so it is possible that Monsanto could attempt to obtain and review a farmer's documents at any point in the future, even after the farmer stops growing Monsanto's seeds; meaning once a farmer signs Monsanto's Technology Agreement, the farmer could be bound by the agreement's terms indefinitely.

The federal Privacy Act protects farmers from having their government records released to others without written permission from the farmer.⁴³ However, by entering into a GMO contract with Monsanto and signing the Technology Agreement, a farmer grants permission for USDA to release of the farmer's government records to Monsanto. The information in these government records will show how many acres of each crop a farmer is planting and the historic crop yields the farmer receives on those acres. The seed and chemical transaction invoices will show how many bags of seed the farmer purchased and whether the farmer purchases chemicals used on herbicide resistant GMOs. All of this information could be used to determine if a farmer is saving seed. For example, Monsanto may calculate that a farmer only purchased enough Roundup Ready soybean seed to plant 125 acres, while the farmer's FSA records show 265 soybean acres were planted. If additional evidence demonstrates that the farmer purchased enough Roundup or generic glyphosate to spray on these additional 140 acres, Monsanto may suspect the farmer is saving soybean seed. At that point, Monsanto may ask for additional records and receipts to show whether the farmer has the resources to litigate with Monsanto. Using all of this information, Monsanto may either seek to inspect a farmer's fields or bring a federal lawsuit against the farmer for saving seed.⁴⁴

One reason Monsanto may seek a particular farmer's records is if Monsanto receives information about the farmer from a neighbor or acquaintance. Monsanto's TUG provides contact information for reporting individuals who are "utilizing biotech traits in a manner" that does not meet Monsanto's definition of a good steward.⁴⁵ Monsanto will treat information provided as "confidential"—meaning Monsanto will attempt to protect the source's identity unless ordered to reveal it by a court—or "anonymous"—meaning the information is reported in a way that the person reporting cannot be identified, including by telephone or unsigned letter.⁴⁶

C. EPA Field Inspections

Another enforcement tool that Monsanto and other companies have at their disposal is to inspect farmers' fields. Besides inspections to check if farmers are saving seed (see Section V below for more information on this type of inspection), companies can inspect fields to ensure compliance with EPA regulations requiring use of "refuges" when GMOs that contain pesticides are grown. If all crop acres were planted with GMOs containing pesticides, insects might develop resistance to the incorporated pesticides, making those GMOs (and other forms of the pesticides) ineffective.⁴⁷ To minimize development of insect resistance to expressed pesticides, farmers growing GMOs containing pesticides are required to set up "refuges" of varieties that do not contain the pesticides.⁴⁸ Monsanto's TUG provides farmers growing Bt crops with refuge configuration options, so long as the farmer has the correct percentage of Bt and non-Bt GMOs. For example, for YieldGard Rootworm corn, up to 80 percent of corn acres on each farm may be planted with YieldGard Rootworm hybrids while at least 20 percent of corn acres must be dedicated to a corn refuge that does not contain Bt technology.⁴⁹ Presumably, if

Monsanto's technology works to kill rootworm or European corn borers, these insects will survive and thrive in the refuge where the technology is absent. Thriving pest populations naturally cause havoc on a farmers' corn yields. According to some reports, this damage to crop yield is why some farmers do not follow the EPA refuge regulations.⁵⁰

In theory, EPA has the legal authority to enforce its own regulations and ensure that insect resistance does not develop.⁵¹ However, according to Monsanto's TUG, this authority has been delegated to Monsanto:

Through an agreement with the Environmental Protection Agency, Monsanto, or an approved agent of Monsanto, will monitor refuge management practices. Upon request by Monsanto or its approved agent, grower is to provide the location of all fields planted with YieldGard technologies and the locations of all associated refuge areas, to cooperate fully with any field inspections, and allow Monsanto to inspect all YieldGard fields and refuge areas to ensure an approved insect resistance program has been followed. All inspections will be performed at a reasonable time and arranged in advance with the grower so that the grower can be present if desired.⁵²

Besides transferring regulatory enforcement authority to a private company, this purported agreement between EPA and Monsanto amounts to letting the fox guard the henhouse, for Monsanto is also legally liable for ensuring its products are used in conformity with EPA regulations. If refuges are not put in place by its farmer customers, Monsanto could be fined \$5,000 per offense for violating EPA regulations.⁵³

D. Marketing and Channeling Grain

GMOs grown in the United States has not received approval in many export markets.⁵⁴ Monsanto places the burden of keeping GM grain out of markets where it is not authorized on U.S. farmers:

Grower Agrees: To direct grain produced from corn containing the Roundup Ready and/or YieldGard Rootworm trait(s) (including stacks) to appropriate markets as necessary to prevent movement to markets within the European Union (until issuance of final approvals).⁵⁵

While efforts have been made by the United States Trade Representative to allow American exports of GMOs to the European Union,⁵⁶ the restrictions are still largely in place.⁵⁷ Monsanto's Technology Agreement recognizes this market restriction and requires that farmers agree to the following:

Grain Marketing: Grain/commodities harvested from Roundup Ready corn, YieldGard Plus corn, YieldGard plus with Roundup Ready corn, Roundup Ready canola, and YieldGard Rootworm corn are approved for U.S. food and feed use, but not yet approved in certain export markets where approval is not certain to be received before the end of 2005. As a result, Grower must direct those grain/commodities to the following approved market options: feeding on farm, use in domestic feed lots, elevators that agree to accept the grain, or other approved uses in domestic markets only. The American Seed Trade Association

web site (www.amseed.org) includes a list of grain handlers' positions on accepting transgenic corn. You must complete and send to Monsanto a Market Choices form.⁵⁸

What this means is that farmers must be sure if they plant any of the above listed crops, that these crops not be commingled with varieties that are approved for export. If farmers attempt to market crops that do not have the necessary export approvals, this could cause entire shipments to be rejected by an importing country.⁵⁹ Because of this risk, one farmer's mistake could cause contamination of millions of bushels of grain. Monsanto attempts to limit its liability for such contamination by requiring farmers to complete and send to Monsanto a "Market Choices" form that specifies where, according to the farmer, the grain was used or marketed. However, as was evident with the StarLink corn debacle, it is extremely difficult to segregate different varieties of crops in the current grain handling system.⁶⁰

E. GMO Seed Warranties and Generic Inputs

For Roundup Ready GMO products, Monsanto encourages, but does not require farmers to use Monsanto's Roundup herbicide. Previously, Monsanto required farmers to use only Roundup because Roundup was patented. In 2000, the patent for Roundup expired and other companies began manufacturing and marketing generic glyphosate equivalents of Roundup.⁶¹ Since that time, Monsanto has been informing farmers that Monsanto does not warrant the use of generic products not authorized by Monsanto.

The 2005 Monsanto Technology Agreement provides that the Grower agrees to the following:

To use on Roundup Ready crops only a Roundup agricultural herbicide or other authorized non-selective herbicide which could not be used in the absence of the Roundup Ready gene (see TUG for details on authorized non-selective products). Use of any selective herbicide labeled for the same crop without the Roundup Ready gene is not restricted by this Agreement. MONSANTO DOES NOT MAKE ANY REPRESENTATIONS, WARRANTIES OR RECOMMENDATIONS CONCERNING THE USE OF PRODUCTS MANUFACTURED OR MARKETED BY OTHER COMPANIES WHICH ARE LABELED FOR USE IN ROUNDUP READY CROP(S). MONSANTO SPECIFICALLY DISCLAIMS ALL RESPONSIBILITY FOR THE USE OF THESE PRODUCTS IN ROUNDUP READY CROP(S). ALL QUESTIONS AND COMPLAINTS ARISING FROM THE USE OF PRODUCTS MANUFACTURED OR MARKETED BY OTHER COMPANIES SHOULD BE DIRECTED TO THOSE COMPANIES.⁶²

In addition to not warranting generic glyphosate products, Monsanto also offers "Roundup Rewards" benefits as an incentive to use Monsanto's Roundup Ready technology instead of one of the generic glyphosate products developed after Monsanto's patent for Roundup expired. To qualify for Roundup Rewards benefits farmers must use labeled Roundup agricultural herbicides for burndown or in-crop applications on any Monsanto trait crops.⁶³ Examples of Roundup Rewards products are

- Trait Crop Loss Refund
- Trait Replant Refund
- Trait Investment Refund
- 30-Minute Rainfast Warranty
- Roundup WeatherMAX
- Roundup Ready Corn 2 Capped Cost Weed Control
- Roundup Ready WeatherMAX Crop Safety Warranty⁶⁴

While these benefits may provide incentives for farmers to use additional Monsanto products, they also require that farmers rely on Monsanto for all crop inputs without the benefit of price or quality comparisons if they want the protection of these additional warranties.⁶⁵

If a farmer wants to challenge the performance of Monsanto's products, because of lower than expected yields or other problems with Monsanto's products, the Technology Agreement attempts to limit Monsanto's liability and resulting damages. The Technology Agreement states that

GROWER'S EXCLUSIVE LIMITED REMEDY: THE EXCLUSIVE REMEDY OF THE GROWER AND THE LIMIT OF THE LIABILITY OF MONSANTO OR ANY SELLER FOR ANY AND ALL LOSSES, INJURY, DAMAGES RESULTING FROM THE USE OR HANDLING OF SEED CONTAINING MONSANTO TECHNOLOGY (INCLUDING CLAIMS BASED IN CONTRACT, NEGLIGENCE, PRODUCT LIABILITY, STRICT LIABILITY, TORT, OR OTHERWISE) SHALL BE THE PRICE PAID BY THE GROWER FOR THE QUANTITY OF THE SEED INVOLVED OR, AT THE ELECTION OF MONSANTO OR THE SEED SELLER, THE REPLACEMENT OF THE SEED. IN NO EVENT SHALL MONSANTO OR ANY SELLER BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL, SPECIAL, OR PUNITIVE DAMAGES.⁶⁶

Whether a court would enforce these limits that, at most, require Monsanto to reimburse farmers for the cost of their seed is an open question,⁶⁷ but Monsanto would likely argue that by signing the Technology Agreement, farmers agree to these limitations.

F. Governing Law and Forum Selection Clauses

Monsanto's Technology Agreement contains Governing Law and Forum Selection clauses that have been strictly enforced.⁶⁸ The Technology Agreement is governed by the laws of the State of Missouri (Monsanto's headquarters are in St. Louis, Missouri). This means courts are to apply Missouri law and not the law of the state where the farmer resides when interpreting Monsanto's contract.⁶⁹

A forum selection clause is a part of a contract where the parties agree to use a specific court or process for all legal disputes. Farmers have disputed forum selection clauses

going back to the Whiskey Rebellion of 1794. According to historian Garry Wills, western Pennsylvania farmers in default for not paying the required excise tax on whiskey had to travel across the state to federal court in Philadelphia for their trials.⁷⁰ Some historians believe this requirement was set up so farmers would comply with the excise tax instead of disputing it.

The Technology Agreement requires that the

PARTIES CONSENT TO THE EXCLUSIVE JURISDICTION AND VENUE OF THE U.S. DISTRICT COURT FOR THE EASTERN DISTRICT OF MISSOURI, EASTERN DIVISION, AND THE CIRCUIT COURT OF THE COUNTY OF ST. LOUIS, MISSOURI, (ANY LAWSUIT MUST BE FILED IN ST. LOUIS, MO) FOR ALL CLAIMS AND DISPUTES ARISING OUT OF OR CONNECTED IN ANY WAY WITH THIS AGREEMENT AND THE USE OF SEED OR THE MONSANTO TECHNOLOGIES EXCEPT FOR COTTON-RELATED CLAIMS MADE BY GROWER.⁷¹

This means that if a farmer wants to claim that Monsanto's products are defective (or bring any other claim under the contract), the farmer must bring that lawsuit in Missouri, regardless of where the farmer lives.⁷² Also, if Monsanto sues the farmer for any reason under the Technology Agreement, Monsanto can bring that lawsuit in Missouri. Courts across the nation have consistently upheld Monsanto's forum selection clause.⁷³ For example, farmers in North Dakota were accused of saving seed illegally and were sued by Monsanto in Missouri federal court.⁷⁴ The farmers attempted to have the North Dakota Seed Arbitration Board provide a recommendation on whether any evidence existed that the farmers infringed on Monsanto's patents, but Monsanto argued this was outside the proper venue, and a federal court in Missouri agreed.⁷⁵ The farmers have now settled the dispute with a confidential agreement.⁷⁶ Furthermore, Monsanto has also taken the far-reaching step of suing farmers in Missouri federal court in response to the farmers filing class action lawsuits against Monsanto in state courts around the nation.⁷⁷

For cotton farmers, Monsanto's Technology Agreement requires that any cotton-related claims or legal disputes be resolved by binding arbitration.⁷⁸ The arbitration hearing is to be held in the capital of the farmer's state. Generally, mandatory arbitration clauses are bad for farmers because they limit the remedies available to farmers, including being able to present their case in court to a jury of their peers.⁷⁹ Under Monsanto's arbitration clause, the farmer and Monsanto each must pay one half of the arbitrator's fees. Being forced to pay arbitration fees could place a great burden on limited resource farmers. Another difference between arbitration and judicial review is that under Monsanto's arbitration clause, the "arbitration proceedings and results are to remain confidential and are not to be disclosed without the written agreement of all parties, except to the extent necessary to effectuate the decision or award of the arbitrator(s) or as otherwise required by law."⁸⁰ This confidential aspect of arbitration limits information available to other farmers who may have similar claims regarding Monsanto's cotton products, but will never know about other farmers' legal disputes and will not be able to use prior arbitration decisions as precedent for their cases.⁸¹

G. Monsanto's Remedies Under Its Technology Agreement

Monsanto has extensive remedies to punish farmers for violating its Technology Agreement. First, Monsanto cuts violators off forever from the use of any Monsanto seed products. Given the large market share Monsanto controls through ownership or license agreements, this could make obtaining seed difficult. Next, Monsanto will come after the farmer for damages, attorneys' fees, and costs of enforcing the Technology Agreement.⁸²

The Technology Agreement states what are Monsanto's damages:

b. Injunction; Infringement and Contract Damages. If Grower is found by any court to have infringed one or more of the U.S. patents listed below, Grower agrees that Monsanto will be entitled to a permanent injunction enjoining Grower from making, using, selling, or offering for sale Seed and patent infringement damages to the full extent authorized by 35 U.S.C. § 283. Grower will also be liable for all breach of contract damages.

c. Attorneys Fees. If Grower is found by any court to have infringed one or more of the U.S. patents listed below or otherwise to have breached this agreement, Grower agrees to pay Monsanto and the licensed Monsanto Technology provider(s) their attorneys fees' and costs.⁸³

Under this provision, farmers could be on the hook for thousands and hundreds of thousands of dollars in damages and potentially face bankruptcy.⁸⁴ This potential for large damage awards may result in many farmers settling with Monsanto instead of litigating claims and allowing a court to decide who is correct.⁸⁵

However, in *Monsanto Co. v. McFarling* a federal appeals court held that Monsanto's remedies provisions from a 1998 Technology Agreement was "invalid and unenforceable under Missouri law" and vacated the \$780,000 judgment against the farmer for saving seed.⁸⁶ The court reasoned that Monsanto's liquidated damages clause that used to require farmers pay 120 times the applicable technology fee times the number of bags of seed purchased is not a reasonable estimate of the financial harm Monsanto would likely suffer if a farmer saved seed and breached its Technology Agreement.⁸⁷ The appeals court sent the case back to the district court to compute the actual damages the farmer caused Monsanto "based on the number of bags of seed saved and replanted."⁸⁸ According to the farmer's attorney in this case, after the court's ruling the farmer will probably end up paying Monsanto about \$10,000 instead of \$780,000.⁸⁹

IV. Can Farmers Save Seed?

For countless generations farmers have taken a portion of their harvest and saved the seed for next year's crop.⁹⁰ Farmers selected the best possible seed either to plant themselves or to exchange with other farmers and breeders who developed improved varieties.⁹¹

In 1970, Congress codified this right in the Plant Variety Protection Act of 1970 (PVPA), which granted companies the authority to obtain plant certificates.⁹² PVPA plant certificates gave legal protection to developers of novel varieties of sexually reproducible plants, but provided that farmers who grew these varieties were still allowed to save their

seed.⁹³ In 1995, the U.S. Supreme Court limited the PVPA seed saving exemption to allow farmers to save seed only for replanting on their own acreage.⁹⁴

A. Growing GMOs and Saving Seed

In 1980, the Supreme Court held that companies could obtain general utility patents for genetically engineered bacterium.⁹⁵ This ruling led the U.S. Patent and Trademark Office in 1985 to grant a patent for genetically engineered corn.⁹⁶ The issue then became whether farmers could save seed that is covered by a general utility patent, including GM seed. The U.S. Supreme Court's 2001 ruling in *J.E.M. Ag Supply v. Pioneer Hi-Bred International*, answered this question with a resounding no.⁹⁷ Pioneer had sued J.E.M. Ag Supply for unauthorized sale of Pioneer brand conventional hybrid corn seed and infringement of Pioneer's patent on the seed. J.E.M. argued that authorization was not needed for the sale and there was no patent infringement. Pioneer based its claim on an argument that its seed was covered by a "general utility patent" that prohibits any unauthorized use, including resale. In its defense, J.E.M. argued that Pioneer's claim was invalid because plant seed could not be patented under general utility patents. J.E.M. argued that the only patent protection for sexually reproducing plants, such as corn, is under the PVPA, which specifically allows seed saving.

On December 10, 2001, the Supreme Court ruled in favor of Pioneer, holding by a vote of 6 to 2 that a valid general utility patent covered Pioneer's seeds. The Court further held that because Pioneer held a utility patent on the seed, the provisions of the PVPA that allow farmers and others to save seed would not apply.⁹⁸ Pioneer's victory has opened the door for other seed companies to obtain and enforce general utility patents for all types of seeds, including GMOs.⁹⁹ With utility patent protections, Monsanto and other seed companies would no longer need to include language in their technology agreements that prohibits farmers from saving seed, because seed saving and all other "unauthorized" uses would be prohibited automatically under the general utility patent—whether the farmer knows of it or not. Therefore, farmers who sign technology agreements prohibiting seed saving that are enforced by a court (a court may declare that Technology Agreements are not enforceable because they are one-sided in favor of the company) or farmers who grow seed varieties that are patented would not be allowed to save their seed.¹⁰⁰ To determine whether a seed variety is patented, farmers are directed to look at the seed bag, bag tag, or sales invoice.¹⁰¹

B. GMO Contamination and Saving Seed

There is increasing concern that farmers who do not grow GMOs, but due to genetic contamination have fields that contain GMOs, will not be able to save their seed.¹⁰² Indiana recently enacted legislation to address this concern. Indiana's law states that a farmer will not be liable to a biotechnology company for breach of a seed contract if "(1) a product in which the seed supplier has rights is possessed by the farmer or found on real property owned or occupied by the farmer; and (2) the presence of the product is de minimus or not intended by the farmer."¹⁰³ Whether such state laws will protect farmers who are innocent possessors of GMOs is an open question.¹⁰⁴

A lot of this concern stems from a Canadian court case in which a Canadian canola farmer was ordered to pay damages for infringing on Monsanto's Roundup Ready canola

patent although the farmer never purchased Roundup Ready canola and only planted seed that he had saved from his own fields.¹⁰⁵ In the summer of 1997, while spraying Roundup in ditches along the edge of one of his fields, the farmer noticed that some of the canola on the edge of the field had survived the spraying. He then sprayed about three acres of the field with Roundup as a test and discovered that many of the plants survived, especially those closest to the ditch. That fall, the farmer harvested the field and stored the seed, which he planted the following year. Monsanto sued him, alleging that he had infringed on its patent by planting for harvest and selling a 1998 canola crop containing the patented Roundup Ready gene. The farmer argued that he could not be liable for patent infringement because the Roundup Ready genes got into his canola crop against his will, either through spilled, water-borne, or wind-blown seed or pollen drift. The trial court ruled for Monsanto and ordered him to pay \$20,000 in damages, the amount of his profit from the 1998 canola crop.

The Canadian Federal Court of Appeal affirmed.¹⁰⁶ The court found that after his 1997 field test the farmer knew or should have known that some of the canola plants in that field contained Monsanto's patented Roundup-resistant gene. When he saved the canola seed from that field and planted it in 1998 for harvest and sale, he infringed on Monsanto's patent. The court held that it did not matter how the genes initially got into the farmer's crop. Nor did it matter that he did not take advantage of the Roundup-resistance of his 1998 canola crop by spraying with Roundup to control weeds.

The court emphasized that the outcome was tied to the unique circumstances of the case. Because of his 1997 discovery and spraying test the farmer had reason to know that the canola he planted, harvested, and sold in 1998 was resistant to Roundup. The court suggested that a GMO patent claim might not be successful in other cases, such as against a farmer who unknowingly harvests and saves seed containing patented genes or a farmer who is aware of and "tolerates" plants showing GM characteristics but does not intentionally propagate the GM genes by saving and replanting the seed. However, if the court's underlying ruling that any amount of GMOs in a farmer's crops is grounds for a patent infringement, regardless of the source, and a farmer then proceeds to save that crop for the next planting season, that farmer could be found in violation of a company's patent.

The farmer appealed the case to the Supreme Court of Canada. On a 5 to 4 vote, the Supreme Court affirmed the lower courts' rulings on the issue that the farmer infringed on Monsanto's patent, but reversed the award of damages and costs to Monsanto.¹⁰⁷ The Supreme Court first determined that the farmer "actively cultivated canola containing the patented invention as part of [his] business operation."¹⁰⁸ The Supreme Court then rejected the argument that the Court "should grant an exemption from infringement to 'innocent bystanders'" that are not aware of GM contamination"¹⁰⁹ The Court stated that the farmer was not a mere "innocent bystander" because he "actively cultivated Roundup Ready Canola."¹¹⁰ Finally, the Supreme Court rejected the argument that under ancient common law property rights, farmers can keep that which comes onto their land, in this case the progeny of the Roundup Ready canola that came onto the farmer's field. The Supreme Court stated "the issue is not property rights, but patent protection. Ownership is no defence [sic] to a breach of the Patent Act."¹¹¹ Therefore, the Court concluded that

“the trial judge and Court of Appeal were correct in concluding that the [farmer] ‘used’ Monsanto’s patented gene and cell and hence infringed the Patent Act.”¹¹²

The Supreme Court of Canada next analyzed what damages should be awarded to Monsanto. Based on the determination that the farmer “made no profits as a result of [Monsanto’s] invention” Monsanto was entitled to “nothing.”¹¹³ Also, due to the “mixed result” of the case the Court ordered each party pay its own costs, overruling the trial court’s order that the farmer pay Monsanto’s substantial costs.¹¹⁴

V. What To Do When Monsanto or Other Such Licensee Companies Are Knocking on Your Door

Farmers who are unfortunate enough to have Monsanto or other such licensee companies come knocking on their doors asking to check their fields should consider a number of questions. First, did the farmer sign a Monsanto Technology Agreement? If the answer is yes, Monsanto will claim certain rights under the contract including the right to records and access to the farmer’s fields, but farmers should not take Monsanto at their word about these rights.

If the answer is no, then the farmer should ask Monsanto for justification as to why access should be allowed. It should be noted that there have been reports of at least one instance where the farmer’s signature was forged on a Monsanto Technology Agreement and Monsanto used that as the basis for inspecting the farmer’s fields.¹¹⁵ Also, an Illinois farmer has filed a class action lawsuit on behalf of farmers nationwide alleging that Monsanto forged signatures on its Technology Agreements and seeking a court order that stops Monsanto from enforcing forged Technology Agreements.¹¹⁶ However, just because a farmer does not sign a Technology Agreement does not get the farmer off the hook from a Monsanto patent infringement claim.¹¹⁷

Next, if Monsanto or its agents demand that samples be taken, at a minimum the farmer should have separate, independent samples taken at the same time and from the same fields. For procedures in ensuring independent field samples are taken from fields, farmers should look at legislation recently enacted in Indiana, North Dakota, and South Dakota.¹¹⁸ As of July 1, 2003, Indiana now requires that if a court orders samples to be taken from a farmer’s field, matching or split samples must be taken by someone independent from the seed supplier.¹¹⁹ South Dakota enacted a similar law in 2002, requiring companies to obtain the farmer’s permission or a court order before entering a field to test whether patent-protected technology is present.¹²⁰ Under South Dakota’s law, either the farmer or the company may request that the South Dakota Secretary of Agriculture collect and test the crop.¹²¹ Likewise, North Dakota enacted a law in 2001 that requires notification and permission from the farmer or a court order before a company may take samples from a farmer’s field to determine whether patent infringement has occurred.¹²²

If Monsanto claims the field test has revealed a violation of its patent rights, those results should be compared with independent testing results and, if possible, retested. If Monsanto still claims a patent violation has occurred, the farmer should seek legal counsel. Attorneys who are experienced in agriculture, litigation, and patent law are the best bet, though often the choice comes down to what attorney is available and

affordable. The farmer should also preserve all records and seed bags that show what seed and chemicals were purchased, that document plantings and that detail crop yields. If the farmer did not save seed, these records may show a chain of custody of non-GM seed and may clear the farmer in court.

VI. What Liability Issues Do Farmers Face When GMO Contamination Occurs?

One of farmers' primary GMO-related problems, revealed by the StarLink corn situation, is that what a farmer's neighbor plants may seriously affect the farmer's own crops.¹²³ This is true because certain crops—such as corn and canola—cross-pollinate, causing genetic material to migrate beyond where the crop was planted.¹²⁴ Until “genetic fences” are developed that stop or contain genetic drift, or “pollution,” from occurring during cross-pollination, disputes may arise between farmers who plant GMOs and their neighbors who do not.¹²⁵ GM contamination may also occur when volunteer crops come up the following year, such as volunteer GM corn that may grow in a soybean field.

Neighbors may suffer damages, for example, by being unable to market their non-GM crop as they wish if the non-GM crops test positive for GMOs that came from a neighboring farmer's field.¹²⁶ Farmers growing GM crops should be aware that if effective barriers to genetic pollution are unavailable or these barriers fail, they might face liability from their neighbors and others for contaminated crops.¹²⁷

Aventis attempted to create a “genetic fence” for StarLink by having farmers plant a 660-foot buffer strip of non-StarLink corn around StarLink cornfields. Corn grown in the buffer strip was also approved only for animal feed or industrial purposes. The use of buffer strips was intended to limit cross-pollination to non-GMO corn and also create a refuge where European corn borers and other targeted pests would not as quickly develop resistance to the Bt found in StarLink corn. Many farmers were reportedly unaware of the buffer strip requirement, resulting in many cases of StarLink corn being planted directly adjacent to a neighbor's non-StarLink corn. This non-StarLink corn then tested positive for the StarLink insecticidal protein Cry9C.

Farmers and seed companies who are responsible for genetically contaminating neighboring fields might be liable for a neighbor's damages based on tort claims of trespass to land, nuisance, negligence, or strict liability. Monsanto's Technology Use Guide recognizes that GM corn may contaminate neighboring fields:

Corn is a naturally cross-pollinated crop and a minimal amount of pollen movement between neighboring fields is a normal occurrence in its production. It is generally recognized in the industry that a certain amount of incidental, trace level pollen movement occurs and it is not possible to achieve 100% purity of seed or grain in any corn production system. A number of factors can influence the occurrence and extent of pollen movement. These factors are described in this Technology Use Guide under the heading “Pollen Movement” on page 17. We encourage you, as stewards of corn technology pending E.U. approval, to consider these factors and talk with your neighbors about your cropping intentions.¹²⁸

While farmers should talk to their neighbors about what crops they are growing, talking alone does not clear farmers of liability if GMO contamination occurs from or onto their farms.

Farmers should also be aware that if they allege injuries from GMOs based solely on lost markets or revenues, courts will generally dismiss these claims under the economic loss doctrine.¹²⁹ For example, in *Sample v. Monsanto Co.*, the district court dismissed claims against Monsanto “based solely on the theory that they lost revenue because the European Union (EU) has rejected GM seed and boycotted all American corn and soy as a result.”¹³⁰ The court ruled that without evidence of GMO contamination the economic loss doctrine prohibited recovery by the farmers. The district court in the *StarLink* litigation noted that “[f]armer’s expectations of what they will receive for their crops are just that, expectations. Absent a physical injury plaintiffs cannot recover for drops in market prices.”¹³¹ Therefore, if farmers wish to proceed with the tort claims described below, they will need to show that some type of physical harm, such as GMO contamination, occurred on their farm. Farmers should also be aware that insurance policies they hold may not protect from GMO contamination depending on the terms and exclusions within the policy.¹³²

A. Trespass to Land

The tort claim of “trespass to land” arises when someone intentionally enters another person’s land and causes damage.¹³³ Entering a person’s land can take many forms, from walking across someone’s land to the invasion of dust particles.¹³⁴ This claim could arise in a GMO context if a farmer or seed company knew that genetic traits from a GM crop would enter a neighbor’s property, and genetic drift in fact occurs, causing harm to the neighbor’s crop. The farmer and/or seed company could then be liable for any resulting harms caused by the GM crop.¹³⁵ While there are no reported trespass cases involving GMOs, there are numerous related cases involving the aerial application of pesticides. For example, in *Alm v. Johnson*, the Idaho Supreme Court held that the aerial application of a pesticide interfered with the plaintiff’s enjoyment of his property and therefore the applicator was liable for trespass.¹³⁶ As one commentator has noted in describing cases dealing with airborne particulates that are similar to pollen, “the courts stressed that they had to look at the character and instrumentality that was used in making an intrusion on another’s land—rather than its size.”¹³⁷ Therefore, if damage can be proven due to the intentional invasion of a GMO through pollen or other means onto another person’s land, a trespass to land claim would exist.¹³⁸

B. Nuisance

A tort similar to trespass to land is private nuisance. Private nuisance occurs when someone interferes with another person’s use and enjoyment of his or her property.¹³⁹ The interference is generally an act that results in obnoxious noise, sights, or smells emanating from the defendant’s property and sensed from the other person’s land. The interfering act does not need to cause property damage, it just has to affect a person’s ability to use and enjoy his or her property. For example, in *Jost v. Dairyland Power Cooperative*, the Wisconsin Supreme Court held that a nuisance existed when a coal power plant emitted sulfur-dioxide gases that caused damages to farmland, because the “value of crops raised had diminished in value and....certain types of vegetation were

dying out or had died out completely.”¹⁴⁰ GMO contamination could affect what crops a neighboring farmer can grow, thereby interfering with the farmer’s ability to use his or her property.¹⁴¹ This could also include an actual loss of value in farmland.¹⁴² If either market or farmland damages could be linked to GMO contamination, a claim for the tort of private nuisance would exist.¹⁴³

C. Negligence

A negligence tort claim arises when a person fails to act reasonably under the circumstances and this failure causes harm to another.¹⁴⁴ The elements of a negligence claim are: (1) the existence of a duty on the part of the defendant to protect plaintiff from injury; (2) failure of defendant to perform that duty; and (3) injury to the plaintiff resulting from such failure.¹⁴⁵ To prove that GMO contamination was the result of negligence, a person would have to prove that a neighboring landowner had a duty to prevent GMO contamination and that there was a reasonably foreseeable likelihood of injury. Commentators have provided the following as an example of how negligence may be determined: “whether a grower was negligent may depend on the position of the crop as compared to the position of adjoining fields, and the specific hazards of planting genetically modified crops next to certain other crops.”¹⁴⁶ Given the potential for certain GM crops to contaminate neighboring fields, a court could find that farmers have a duty to prevent this injury to their neighbors.¹⁴⁷ If a duty were established, neighbors would then have to show that this duty was breached by the grower of GM crops and damages were incurred due to that breach of duty.¹⁴⁸ Failure to select seed properly, adhere to specified buffer zones, or follow growing and harvesting procedures could mean a breach of that duty.¹⁴⁹ If one of these failures is linked to another person’s injuries, the farmer or seed company that caused the GMO contamination could be liable for negligence.

D. Strict Liability

Another potential tort claim related to GMO contamination is strict liability.¹⁵⁰ Strict liability arises when someone engages in an abnormally dangerous activity; in such cases, a person harmed by the abnormally dangerous activity can recover damages from the person who engaged in the activity, without having to prove that the person who did the activity was reckless or negligent.¹⁵¹ Courts have found abnormally dangerous activities to include housing wild animals,¹⁵² storing and using explosives,¹⁵³ or spraying pesticides.¹⁵⁴ Some legal scholars argue that if a farmer and/or seed company knows that a GM crop is difficult to control and that it will likely cross-pollinate with crops in adjacent fields, the farmer and/or seed company should be held strictly liable for any resulting damages.¹⁵⁵

Courts assessing genetic contamination claims based on strict liability may compare them to past pesticide drift cases. In an often-cited 1977 Washington State Supreme Court case, *Langan v. Valicopters*, the court held that an aerial spray company, which allowed pesticides to drift onto an organic farm, was strictly liable for damages because the organic farm faced losing its ability to market organic crops and the farmer would be unable to sell crops on the regular commercial market due to failure to enter into a contract before the growing season began.¹⁵⁶ The holding in *Langan* could be used to argue that seed companies who develop and farmers who raise GM crops that genetically “pollute” a crop could be strictly liable for damages to neighboring crops.¹⁵⁷ Such

damages could include loss of organic certification with resulting loss of ability to meet contract obligations or market crops at higher premiums, costs related to violating identity-preserved crop contracts because the crops no longer meet the required specifications, or even litigation costs when neighboring farmers are sued by companies for “stealing” genetic intellectual property that was in actuality blown onto their fields. If a court determines that GMOs are “abnormally dangerous,” a neighbor affected by GMO contamination would have a claim of strict liability.

VII. How Farmers Can Protect Themselves From GMO Contamination

The widespread use of GMOs has caused some farmers to reassess their production practices.¹⁵⁸ Whether farmers grow GMO, non-GMO, or organic crops, they need to implement management practices that may ensure they can protect themselves from GMO contamination.¹⁵⁹ While GMO contamination may still occur, farmers can minimize this risk by following the requirements of an identity preserved contract and implementing due diligence in purchasing seed and in the field.¹⁶⁰

A. Seed Selection

Increasingly, farmers who save or purchase seeds which are the same varieties or types of crops that are GMO need to take extra precaution. Farmers should be advised not to assume that such seeds have not been contaminated and should seek adequate reassurances from their dealer and/or seed producers that such contamination has not occurred. Failure to test or receive adequate assurances can result in market rejections or other unintended losses for the farmers and markets involved. Of special concern is a recent report, *Gone to Seed, Transgenic Contaminants in the Traditional Seed Supply*, published by the Union of Concerned Scientists (UCS), which concludes that “Seeds of traditional varieties of corn, soybeans, and canola are pervasively contaminated with low levels of DNA sequences derived from transgenic varieties.” Their report calls for private seed companies to do better testing and screening and for federal government to implement a series of protective initiatives to prevent further transgenic contamination in the traditional crop seed supply.¹⁶¹

B. Identity Preserved Contracts

Another way for farmers to protect themselves from GMO contamination and garner a premium for their crops is to enter into and follow the guidelines of an identity preserved contract. The increased use of GMOs has led companies to contract for crops that are identity preserved as non-GMO (though not necessarily certified organic under the National Organic Program). Some of these identity preserved contracts are for commodities with special characteristics. For example, some companies desire crops with high oil content.

DuPont Protein Technologies had a 2003 Identity Preserved Non-GM Soybean Program contract that provided a 35-cent per bushel premium to growers who delivered at harvest non-GMO, identity preserved grain to a participating elevator.¹⁶² In addition to moisture and damage quality specifications, the soybeans could not contain more than 0.5% genetically modified or transgenic material or else would be subject to rejection with no premium paid. The contract specified that “transgenic or GM (genetically modified) refers to seeds or crops that contain transgenic DNA; e.g., Bt-derived insect resistance,

Roundup Ready or Liberty Link herbicide resistance, etc. Bt corn is a GM and can cause rejection if found if the Non-GM GRAIN.” To ensure that this GMO tolerance was met, the delivery elevator was to sample each load of non-GM grain to determine purity. Growers were also required to certify they adhered to an “Identity Preservation Checklist” that includes the following:

- Seeds will be kept separate from GMs, in closed containers until used.
- Planter and drill boxes will be swept/blown clean and visually inspected to be free of contaminants before use.
- Fields where Non-GM seeds will be planted will be physically separated from other varieties OR Minimum of 20 foot border rows will be established between other varieties within same fields.
- Actual Non-GM acres planted for this contract will be reported to DPT [DuPont Protein Technologies].
- Field(s) planting history will be maintained to establish crops planted in Non-GM contract field(s).
- Combine will be blown or swept clean and visually verified to be free of other grain.
- Flush run will be used to assure equipment is free of contaminants.
- All bins used to store Non-GM grain will be labeled with Identity Preserved Stickers or other method.
- Drivers will be clearly instructed as to the identity preserved nature of the shipment.

Identity preserved contracts are one method of allocating risk and, if followed correctly, minimizing the risk of GMO contamination.¹⁶³ However, if farmers fail to meet these standards, whether due to factors within their control or not, they will lose the price premium but still retain the added production costs associated with identity preserved production.¹⁶⁴

C. Production Methods

Farmers do not need to enter into contracts to limit their risk of GMO contamination. The primary means of limiting contamination, especially for organic farmers, is to ensure all possible measures are implemented to keep one’s crops GMO-free.¹⁶⁵ This starts with careful seed selection. One approach is to purchase seeds with a certification that (1) they come from GMO-free areas that have ample isolation distances between non-GM and GM crops, and (2) they were segregated during processing.¹⁶⁶ In part to ensure GMO-free seed, the State of Vermont recently enacted a law that requires labeling of seed that contains GMOs.¹⁶⁷

The next step is to ensure that GM-free crops are not planted near GM crops.¹⁶⁸ If neighboring crops contain GMOs then wind or insects may bring GM pollen into the

GM-free field and contaminate the crop intended to be non-GMO. What distance is sufficient between non-GM and GM crops varies by crop, and there is debate among scientists how much distance is enough to avoid pollen drift. For some crops, such as soybeans, the distance needed is not great because soybeans largely self-pollinate (though bees may carry and cross-pollinate GM traits to non-GM soybeans), while for other crops, such as corn and canola, the distances are greater, especially in windy areas where pollen could travel great distances.

After seed and field conditions are taken into account, the next risk area is equipment. Sharing of planters, combines, trucks, and other equipment between conventional farms that grow GMOs and GMO-free farms risks contamination because the equipment may not always be completely cleaned between uses.¹⁶⁹ Besides the risk of contamination at harvest through not enough cleaning, the mixing of GM and non-GM crops in storage and transport may cause contamination. If possible, farmers should not use their neighbors equipment or custom harvesters to avoid GMO contamination. One important lesson from StarLink was that even if farmers maintain proper buffer zones and other barriers between GM and non-GM crops, contamination might still occur throughout the grain handling system, including transportation systems.¹⁷⁰

Through each of these steps in crop production, farmers can attempt to protect themselves by testing for the presence of GMOs. Testing does not eliminate risk, but does put farmers on notice that their crops may contain GMOs and can help them contain any contamination that does occur. According to one report, GMO tests cost more than \$300 each per sample, though testing companies will offer a variety of services and prices from strip tests that can be done on loads of grain to full laboratory analysis.¹⁷¹ Farmers will often have to pay for these testing services in order to assure customers that their crops are GMO-free. The Iowa Grain Quality Initiative has put together a list of GMO testing companies, *available at* <http://www.extension.iastate.edu/Pages/grain/publications/testing/testingcos.html>.

Without testing, farmers risk having their GM-free crops rejected by the marketplace. Organic farmers might risk losing their organic certification.¹⁷² According to the Organic Farming Research Foundation, at least 17 percent of organic farmers surveyed have had their seed or other inputs tested for GMOs and, of those farmers tested, 11 percent came back with positive results for GMOs.¹⁷³ USDA's National Organic Program requires that certified organic farmers must not use production methods that are excluded, including the use of GMOs.¹⁷⁴ However, it should be noted that, according to USDA, the mere detection of GMO residue would not necessarily cause farmers to lose their organic certification, but could trigger an investigation by the organic certifier.¹⁷⁵ Therefore, organic farmers need to be careful in both their production methods and testing methods for GMOs to ensure they comply with federal organic regulations or else they may no longer be considered "organic."¹⁷⁶

Another thing all farmers should be careful about is that when making sales they only make representations about actions that were actually in their control.¹⁷⁷ This might include the fact that the seed planted was represented by their seed company as being non-GM seed and that care was taken to avoid contamination from GM crops. As discussed in this section, these precautions may include careful cleaning of equipment

and storage bins and testing of seed and crops for GMOs. Farmers should avoid promising that a crop contains all non-GM material or promising that a crop was not genetically contaminated from a neighbor's crop or during harvest and storage.¹⁷⁸ Before making any decisions regarding non-GMO warranties, farmers should consult with an attorney.

VIII. International Issues

An in-depth discussion of international GMO issues is beyond the scope of this guide. However, farmers should be strongly advised to not assume that a foreign or domestic market will accept their crop if it is GMO. Japan has very strong opposition to accepting GMO crops and the European Union's *de facto* moratorium on GM crops has been a primary source of potential liability for farmers raising GM crops.¹⁷⁹ Until very recently, the European Union has not approved many varieties of GMOs grown by American farmers, including Roundup Ready and YieldGard crops.¹⁸⁰ On July 19, 2004, the European Commission authorized the use of Monsanto's Roundup Ready corn for animal feed or industrial uses,¹⁸¹ but it was not able to reach a decision on the use of this GM corn for human food consumption.¹⁸² Prior to the widespread use of GMOs, Europe was one of the United States' biggest agricultural export markets, with \$250 million in corn exports in 1998.¹⁸³ However, now, as discussed above, if one of these non-approved GM crops contaminates a non-GM crop that is being shipped to Europe or other markets, damages could result in the loss of contracts or even export markets.

The United States has challenged the European Union's moratorium before the World Trade Organization.¹⁸⁴ The filing of a WTO complaint could expose other issues in the American-versus-European conflict over regulation of GMOs, including how farmer liability should be addressed and corporate control of GM crops.¹⁸⁵ For example, Switzerland in 2003 enacted a new law that requires labeling of GMOs that are marketed and imposes liability on persons that handle GMOs that cause damages.¹⁸⁶ Other EU member countries are also pursuing or have pursued national GMO liability legislation, such as Germany and Denmark.

Another large international trade issue is the recent ratification by the necessary number of countries of the Cartagena Protocol on Biosafety.¹⁸⁷ As described by the member organizations:

The Protocol seeks to protect biological diversity from the potential risks posed by living modified organisms resulting from modern biotechnology. It establishes an advance informed agreement (AIA) procedure for ensuring that countries are provided with the information necessary to make informed decisions before agreeing to the import of such organisms into their territory.¹⁸⁸

What this means for American farmers is as yet unclear. The United States has not signed on to the Cartagena Protocol on Biosafety, but many of the countries that are export markets for U.S. agricultural products have signed on. This could mean more rigorous crop production, segregation, and tracking procedures for farmers who grow GMOs, and for those who don't.¹⁸⁹ As with the European Union moratorium, this could create additional liability concerns for American farmers marketing their crops.

Additionally, the newly released report – Maize and Biodiversity, The Effects of Transgenic Maize in Mexico by the Commission for Environmental Cooperation of North America, 8 November 2004, recommended that US corn being imported into Mexico should be labeled as containing GMO or else certified GM-free because according to this report the importation of unlabelled US corn is leading to the contamination of the world's genetic home for corn. What this and the other effects listed in this report has on US corn farmers and their ability to export to Mexico is unclear. US farmers wishing to export corn to Mexico should be fully advised of these new challenges.¹⁹⁰

What other grain-producing countries decide about the permissible use of GMOs impacts American farmers.¹⁹¹ For example, Brazil, the world's second largest producer of soybeans, has until very recently, banned the use of GMOs, and a ban on GMO seed sales continues, meaning Brazilian farmers can use their saved Roundup Ready seed, but cannot purchase new seed from Monsanto.¹⁹² However, recently Monsanto has entered into agreements where instead of farmers directly paying Monsanto technology fees, Monsanto will be compensated for the use of Roundup Ready soybeans in some parts of Brazil by farm cooperative organizations.¹⁹³ While the use ban was in place, there were reports that many Brazilian soybean farmers used GMO technology.¹⁹⁴ Whatever the final result of Brazil's regulation of the use of GMOs, Brazil's decision impacts where American farmers can export their GM and non-GM crops.

Another example from South America is Monsanto's practice of selling Roundup Ready soybeans in Argentina, but not charging technology fees for these products, making the cost of the GM seed much cheaper in Argentina.¹⁹⁵ If American soybean farmers are expected to compete on a national stage with Argentinean soybean farmers, Monsanto is making the playing field uneven.¹⁹⁶ Overall, Monsanto is giving other countries' producers a price break on GMO technologies in order to overcome resistance to using GMOs; whereas in the United States, where the federal government has limited regulation and promotes the use of GMOs, American farmers get to pay "full" price for GMO technologies.¹⁹⁷ In December 2003, Monsanto announced that it would stop selling GM soybean seed to Argentina, citing the huge black market for GM soybean seed for which Monsanto could not recover its investments.¹⁹⁸

IX. GMO Costs and Benefits

A general perception about GM crops is that they decrease farmers' use of pesticides.¹⁹⁹ GMO technology that directly incorporates a pesticide into the plant reduces farmers' pesticide *applications* because the plant itself, such as Bt corn, generates the desired pesticide itself. Herbicide tolerant crops are thought to reduce farmer's use of pesticides because spraying once or twice kills all the weeds, while leaving the GM plant unharmed versus having to go back for multiple sprayings to control weeds while avoiding impacts on the conventional crop plant.

However, recent research by the Northwest Science and Environmental Policy Center asserts that pesticide use has actually increased on herbicide tolerant crops.²⁰⁰ Using USDA data, the report compares the difference between average pounds of pesticides applied on GMO-planted acres to conventionally planted acres. The report states that

In the first three years of commercialization (1996-1998), [GM] corn, soybean, and cotton varieties reduced the total pounds of herbicides plus insecticides applied by an estimated 25.4 million pounds, but the volume of pesticides applied to the same [GM] varieties in the last three years (2001-2003) increased 73.1 million pounds.²⁰¹

This increase occurred despite a 2 to 2.5 million annual reduction in pesticides from the use of Bt corn and cotton crops.

Why the increase in pesticide usage for herbicide tolerant crops? The report assumes that many factors contributed to this increase, including “changes in tillage and planting systems, shifts in herbicide formulations, falling prices for glyphosate, herbicide marketing strategies, and the growing popularity of low- and reduced rate herbicides.”²⁰² Overall, the report concludes that the primary factor for the increased pesticide usage was farmers’ reliance on a single herbicide, glyphosate, which must be sprayed in increasing amounts to keep up with shifts in weed populations toward more difficult to control species and the development of resistance by certain weeds.²⁰³ Whether this trend will continue is difficult to assess, but increased herbicide resistance by weeds²⁰⁴ and the potential for new pests to appear, such as aphids in soybeans,²⁰⁵ may create conditions that result in more and not less overall pesticide use on GM crops. Related to these concerns, there was a recent study published that questioned whether Roundup Ready soybeans was responsible for flattening U.S. soybean yields.²⁰⁶

Resources

Keith Aoki, *Traditional Knowledge, Intellectual Property, and Indigenous Culture: Article: Weeds, Seeds, and Deeds: Recent Skirmishes in Seed Wars*, 11 CARDOZO J. INT'L & COMP. L. 247 (Summer 2003), available at <http://www.law.uoregon.edu/faculty/kaoki/site/articles/weedsandseeds.pdf>.

Kevin M. Baird, *Pioneer Hi-Bred International v. J.E.M. Ag Supply: Patent Protection of Plants Grows Under the Supreme Court's Latest Decision*, 2002 U. ILL. J.L. TECH. & POL'Y 269 (Spring 2002).

Charles M. Benbrook, *Impacts of Genetically Engineered Crops on Pesticide Use in the United States: The First Eight Years*, BioTech InfoNet (Nov. 2003), available at http://www.biotech-info.net/Technical_Paper_6.pdf.

Lonie Boens, *Glyphosate-Resistant Soybeans: An Introduction*, 6 GREAT PLAINS NAT. RESOURCES J. 36 (Fall 2001).

Rebecca M. Bratspies, *Myths of Voluntary Compliance: Lessons from the StarLink Corn Fiasco*, 27 WM. & MARY ENVTL. L. & POL'Y REV. 593 (Spring 2003).

Nathan A. Busch, *Jack and the Beanstalk: Property Rights in Genetically Modified Plants*, 3 MINN. INTELL. PROP. REV. 1 (2002), available at <http://mipr.umn.edu/archive/v3n2/busch.pdf>.

Commission for Environmental Cooperation, *Maize and Biodiversity: The Effects of Transgenic Maize in Mexico: Key Findings and Recommendations*, (November 8 2004), available at http://www.ccc.org/files/PDF/Maize-and-Biodiversity_en.pdf.

DANIEL CHARLES, LORDS OF THE HARVEST: BIOTECH, BIG MONEY, AND THE FUTURE OF FOOD (2001).

Anne E. Crocker, *Will Plants Finally Grow Into Full Patent Protection on an International Level? A Look at the History of U.S. and International Patent Law Regarding Patent Protection for Plants and the Likely Changes After the U.S. Supreme Court's Decision in J.E.M. Ag Supply v. Pioneer Hi-Bred*, 8 DRAKE J. AGRIC. L. 251 (Summer 2003).

Marcia Ellen DeGeer, *Can Roundup Ready Seeds Ever be Corralled?: Restraining Genetic Drift Through Criminal Sanctions*, 29 N.E. J. ON CRIM. & CIV. CON. 255, 283-86 (Summer 2003).

A. Bryan Endres, "GMO: " *Genetically Modified Organism or Gigantic Monetary Obligation? The Liability Schemes for GMO Damage in the United States and the European Union*, 22 LOY. L.A. INT'L & COMP. L. REV. 453 (2000).

Carie-Megan Flood, *Pollen Drift and Potential Causes of Action*, 28 IOWA J. CORP. L. 473 (2003).

General Accounting Office, *Biotechnology: Information on Prices of Genetically Modified Seed in the United States and Argentina*, GAO-00-55 (Jan. 2000), available at <http://www.gao.gov/archive/2000/r400055.pdf>.

General Accounting Office, *International Trade: Concerns Over Biotechnology Challenge U.S. Agricultural Exports*, GAO-01-727 (June 2001).

General Accounting Office, *Genetically Modified Foods: Experts View Regimen of Safety Tests as Adequate, but FDA's Evaluation Process Could Be Enhanced*, GAO-02-566 (May 2002).

Margaret Rosso Grossman & A. Bryan Endres, *Regulation of Genetically Modified Organisms in the European Union*, 44 AMERICAN BEHAVIORAL SCIENTIST 378 (2000).

Margaret Rosso Grossman, *Genetically Modified Crops in the United States: Federal Regulation and State Tort Liability*, ENVIRONMENTAL LAW REVIEW (2003).

- Neil D. Hamilton, *Legal Issues Shaping Society's Acceptance of Biotechnology and Genetically Modified Organisms*, 6 DRAKE J. AGRIC. L. 81 (2001).
- Neil D. Hamilton, *Why Own the Farm If You Can Own the Farmer (and the Crop)?: Contract Production and Intellectual Property Protection of Grain Crops*, 73 NEBR. L. REV. 48 (1994).
- Neil Harl, *Biotechnology Policy: Global Economic and Legal Issues*, 12 WILLIAMETTE J. INT'L L. & DISP. RES. 2004.
- Neil Harl, *Genetically Modified Crops: Guidelines for Producers*, Iowa State University (2000), available at <http://www.extension.iastate.edu/Pages/grain/publications/buspub/0010harl1.pdf>.
- Neil Harl, *The StarLink Situation*, Iowa Grain Quality Initiative (Nov. 18, 2003), available at <http://www.extension.iastate.edu/Pages/grain/publications/buspub/0010star.PDF>.
- Ann Hazlett, *White House Announces Plan to Further Regulate Genetically-modified Crops*, AGRIC. L. UPDATE, Sept. 2002.
- Iowa Attorney General, *Grain Production Contract Checklist* (1999), available at http://www.state.ia.us/government/ag/working_for_farmers/brochures/grain_production.html.
- Mark D. Janis & Jay P. Kesan, *The Future of Patent Law: U.S. Plant Variety Protection: Sound and Fury ... ?*, 39 HOUS. L. REV. 727 (2002).
- Adam W. Jones, *What Liability of Growing Genetically Engineered Crops?*, 7 DRAKE J. AGRIC. L. 621 (2002).
- Drew Kershen, *Of Straying Crops and Patent Rights*, 43 WASHBURN L.J. 575 (Spring 2004).
- Drew Kershen, *Legal Liability Issues in Agricultural Biotechnology*, National AgLaw Center (Nov. 2002), available at http://www.nationalaglawcenter.org/assets/article_kershen_biotech.pdf.
- BILL LAMBRECHT, *DINNER AT THE NEW GENE CAFÉ: HOW GENETIC ENGINEERING IS CHANGING WHAT WE EAT, HOW WE LIVE, AND THE GLOBAL POLITICS OF FOOD* (2001).
- Stephen Kelly Lewis, *"Attach of the Killer Tomatoes?" Corporate Liability for the International Propagation of Genetically Altered Agricultural Products*, 10 TRANSNAT'L L. 153 (Spring 1997).
- John P. Mandler & Kristin R. Eads, *Liability Exposure to Seed Companies from Adventitious GMO Pollination Due to Pollen Drift Resulting in Cross Pollination or Outcrossing*, Faegre & Benson (Jan. 26, 2000), available at <http://www.faegre.com/downloads/gmo.doc>.
- Emily Marden, *Risk and Regulation: U.S. Regulatory Policy on Genetically Modified Food and Agriculture*, 44 B.C. L. REV. 733, 780 (May 2003).
- Marc C. Mayerson, *Insurance Recovery for Losses from Contaminated or Genetically Modified Foods*, 39 TORTS & INS. L.J. 837 (Spring 2004).
- Roger A McEowen, *Legal Issues Related to the Use and Ownership of Genetically Modified Organisms*, 43 WASHBURN L.J. 611 (Spring 2004).
- Margaret Mellon & Jane Rissler, *Gone to Seed: Transgenic Contamination in the Traditional Seed Supply*, Union of Concerned Scientists (2004), available at http://www.ucsusa.org/food_and_environment/biotechnology/page.cfm?pageID=1315.
- David R. Moeller, *State GMO Restrictions and the Dormant Commerce Clause*, AGRIC L. UPDATE. Aug. 2001, available at <http://www.flaginc.org/pubs/arts/GMOrestrict.pdf>.

David R. Moeller, *GMO Liability Threats for Farmers, Legal Issues Surround the Planting of Genetically Modified Crops*, Institute for Agriculture and Trade Policy (Nov. 2001), available at <http://www.flaginc.org/pubs/arts/GMOthreats.pdf>.

David R. Moeller, *State Legislative Activity on GMOs*, 18 FARMERS' LEGAL ACTION REPORT 3 (2003).

Amelia P. Nelson, *Legal Liability in the Wake of StarLink: Who Pays in the End*, 7 DRAKE J. AGRIC. L. 241 (Spring 2002).

Nicole C. Nachtigal, *A Modern David and Goliath Farmer v. Monsanto: Advising a Grower on the Monsanto Technology Agreement 2001*, 6 GREAT PLAINS NAT. RESOURCES J. 50 (2001).

NATIONAL ACADEMY OF THE SCIENCES, *BIOLOGICAL CONFINEMENT OF GENETICALLY ENGINEERED ORGANISMS* (2004), available at <http://www.nap.edu/books/0309090857/html>.

NATIONAL ACADEMY OF THE SCIENCES, *SAFETY OF GENETICALLY ENGINEERED FOODS: APPROACHES TO ASSESSING UNINTENDED HEALTH EFFECTS* (2004), available at <http://www.nap.edu/openbook/0309092094/html>.

Samantha M. Ohlgart, *The Terminator Gene: Intellectual Property Rights vs. the Farmers' Common Law Right to Save Seed*, 7 DRAKE J. AGRIC. L. 473 (Summer 2002).

Scott S. Partridge, *The Use of the Class Action Device in Agricultural Products Litigation*, 6 DRAKE J. AGRIC. L. 175 (2001).

MICHAEL POLLAN, *THE BOTANY OF DESIRE: A PLANT'S EYE VIEW OF THE WORLD* (2001).

PETER PRINGLE, *FOOD, INC.: MENDEL TO MONSANTO—THE PROMISES AND PERILS OF THE BIOTECH HARVEST* (2003).

Thomas P. Redick & Christina G. Bernstein, *Nuisance Law and the Prevention of "Genetic Pollution": Declining a Dinner Date with Damocles*, 30 ENVTL. L. REP. 10328 (2000).

Thomas P. Redick, *Biopharming, Biosafety, and Billion Dollar Debacles: Preventing Liability for Biotech Crops*, 8 DRAKE J. AGRIC. L. 115 (Spring 2003).

Richard A. Repp, *Biotech Pollution: Assessing Liability for Genetically Modified Crop Production and Genetic Drift*, 36 IDAHO L. REV. 585 (2000), available at <http://www.worc.org/foodfight/liability-IDlawjournal.html>.

James Riddle, *10 Strategies to Minimize Risks of GMO Contamination*, THE NEW FARM, available at <http://www.newfarm.org/features/0802/strategies.shtml>.

Michael T. Roberts, *J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred International, Inc.: Its Meaning and Significance for the Agricultural Community*, National AgLaw Center (Nov. 2002), available at http://www.nationalaglawcenter.org/assets/article_roberts_jem.pdf.

Stephen M. Scanlon, *Should Missouri Farmers of Genetically Modified Crops Be Held Liable for Genetic Drift and Cross-Pollination?*, 10 MO. ENVTL. L. & POL'Y REV. 1 (2002).

Michael Sykuta & Joe Parcell, *Contract Structure and Design in Identity Preserved Soybean Production*, University of Missouri - Columbia Contracting and Organizations Research Institute (June 2002), available at <http://cori.missouri.edu/WPS/CORI-WPS02-01.pdf>.

Kent Thiesse, *Be Cautious About Signing GMO-Free Documents*, THE CORN AND SOYBEAN DIGEST (Jan. 2, 2002), available at http://soybeandigest.com/ar/soybean_cautious_signing_gmofree/.

Donald L. Uchtmann, *Regulating Foods Derived From Genetically Engineered Crops*, AGRIC. L. UPDATE, May 2000.

Donald L. Uchtmann, *StarLink—A Case Study of Agricultural Biotechnology Regulation*, 7 DRAKE J. AGRIC. L. 159 (Spring 2002).

Donald L. Uchtmann, *Can farmers save Roundup Ready Beans for Seed? McFarling and Trantham Cases Say No*, AGRIC L. UPDATE, Oct. 2002.

2005 MONSANTO TECHNOLOGY/STEWARDSHIP AGREEMENT

(Limited Use License)

This Monsanto Technology/Stewardship Agreement is entered into between you (Grower) and Monsanto Company (Monsanto) and consists of the terms on this page and on the reverse side of this page.

This Monsanto Technology/Stewardship Agreement grants Grower a limited license to use Roundup Ready® soybeans, YieldGard® Corn Borer corn, YieldGard Rootworm® corn, YieldGard Rootworm with Roundup Ready® corn, YieldGard® Plus corn**, YieldGard Plus with Roundup Ready® corn*, Roundup Ready® corn, Roundup Ready® corn 2, YieldGard Corn Borer with Roundup Ready® corn, Roundup Ready® cotton, Bollgard® cotton, Bollgard® with Roundup Ready® cotton, Bollgard® II cotton, Bollgard® II with Roundup Ready® cotton, Roundup Ready® sugarbeets, Roundup Ready® canola, and Roundup Ready® alfalfa* (Monsanto Technologies). This Agreement also contains Grower's stewardship responsibilities and requirements associated with the Monsanto Technologies.

GOVERNING LAW: This Agreement and the parties' relationship shall be governed by the laws of the state of Missouri and the United States (without regard to the choice of law rules).

BINDING ARBITRATION FOR COTTON-RELATED CLAIMS MADE BY GROWER: Any claim or action made or asserted by a cotton Grower (or any other person claiming an interest in the Grower's cotton crop) against Monsanto or any seller of cotton Seed containing Monsanto Technology arising out of and/or in connection with this Agreement or the sale or performance of the cotton Seed containing Monsanto Technology other than claims arising under the patent laws of the United States must be resolved by binding arbitration. The parties acknowledge that the transaction involves interstate commerce. The parties agree that arbitration shall be conducted pursuant to the provisions of the Federal Arbitration Act, 9 U.S.C. Sec 1 et seq. and administered under the Commercial Dispute Resolution Procedures established by the American Arbitration Association ("AAA"). The term "seller" as used throughout this Agreement refers to all parties involved in the production, development, distribution, and/or sale of the Seed containing Monsanto Technology. In the event that a claim is not amicably resolved within 30 days of Monsanto's receipt of the Grower's notice required pursuant to this Agreement any party may initiate arbitration. The arbitration shall be heard in the capital city of the state of Grower's residence or in any other place as the parties decide by mutual agreement. When a demand for arbitration is filed by a party, the Grower and Monsanto/sellers shall each immediately pay one half of the AAA filing fee. In addition, Grower and Monsanto/sellers shall each pay one half of AAA's administrative and arbitrator fees as those fees are incurred. The arbitrator(s) shall have the power to apportion the ultimate responsibility for all AAA fees in the final award. The arbitration proceedings and results are to remain confidential and are not to be disclosed without the written agreement of all parties, except to the extent necessary to effectuate the decision or award of the arbitrator(s) or as otherwise required by law.

FORUM SELECTION FOR NON-COTTON-RELATED CLAIMS MADE BY GROWER AND ALL OTHER CLAIMS: THE PARTIES CONSENT TO THE SOLE AND EXCLUSIVE JURISDICTION AND VENUE OF THE U.S. DISTRICT COURT FOR THE EASTERN DISTRICT OF MISSOURI, EASTERN DIVISION, AND THE CIRCUIT COURT OF THE COUNTY OF ST. LOUIS, MISSOURI, (ANY LAWSUIT MUST BE FILED IN ST. LOUIS, MO) FOR ALL CLAIMS AND DISPUTES ARISING OUT OF OR CONNECTED IN ANY WAY WITH THIS AGREEMENT AND THE USE OF THE SEED OR THE MONSANTO TECHNOLOGIES, EXCEPT FOR COTTON-RELATED CLAIMS MADE BY GROWER.

THIS AGREEMENT CONTAINS A BINDING ARBITRATION PROVISION FOR COTTON RELATED CLAIMS PURSUANT TO THE PROVISIONS OF THE FEDERAL ARBITRATION ACT, 9 U.S.C. §1 ET SEQ., WHICH MAY BE ENFORCED BY THE PARTIES.

GROWER SIGNATURE & DATE REQUIRED

Name Date

[The Agreement continues below and on the reverse side of this page.]

4. GROWER AGREES:

To direct grain produced from corn containing the Roundup Ready and/or YieldGard Rootworm trait(s) (including stacks) to appropriate markets as necessary to prevent movement to markets within the European Union (until issuance of final approvals).

To implement an Insect Resistance Management program as specified in the applicable Bollgard cotton and YieldGard corn sections of the most recent Technology Use Guide (TUG) and to cooperate and comply with Insect Resistance Management programs.

To use Seed containing Monsanto Technologies solely for planting a single commercial crop.

Not to supply any Seed containing patented Monsanto Technologies to any other person or entity for planting. Not to save any crop produced from Seed for planting and not to supply Seed produced from Seed to anyone for planting.

Not to use or to allow others to use Seed containing patented Monsanto Technologies for crop breeding, research, generation of herbicide registration data, or Seed production (unless Grower has entered into a valid, written production agreement with a licensed seed company).

To use on Roundup Ready crops only a Roundup® agricultural herbicide or other authorized non-selective herbicide which could not be used in the absence of the Roundup Ready gene (see TUG for details on authorized non-selective products). Use of any selective herbicide labeled for the

same crop without the Roundup Ready gene is not restricted by this Agreement. MONSANTO DOES NOT MAKE ANY REPRESENTATIONS, WARRANTIES OR RECOMMENDATIONS CONCERNING THE USE OF PRODUCTS MANUFACTURED OR MARKETED BY OTHER COMPANIES WHICH ARE LABELED FOR USE IN ROUNDUP READY CROP(S). MONSANTO SPECIFICALLY DISCLAIMS ALL RESPONSIBILITY FOR THE USE OF THESE PRODUCTS IN ROUNDUP READY CROP(S). ALL QUESTIONS AND COMPLAINTS ARISING FROM THE USE OF PRODUCTS MANUFACTURED OR MARKETED BY OTHER COMPANIES SHOULD BE DIRECTED TO THOSE COMPANIES.

To read and follow the applicable sections of the TUG, which is incorporated into and is a part of this Agreement, for specific requirements relating to the terms of this Agreement, and to abide by and be bound by the terms of the TUG as it may be amended from time to time.

To acquire Seed containing these Monsanto Technologies only from a seed company with technology license(s) from Monsanto or from a licensed company's authorized dealer.

To pay the technology fees due to Monsanto that are a part of or collected with the Seed purchase price.

Upon written request, to allow Monsanto to review the Farm Service Agency crop reporting information on any land farmed by Grower including Summary Acreage History Report, Form 578 and corresponding aerial photographs, Risk Management Agency claim documentation, and dealer/retailer invoices for your seed and chemical transactions.

To allow Monsanto to examine and copy any records and receipts that could be relevant to Grower's performance of this Agreement.

* Final regulatory approvals are pending for Roundup Ready alfalfa and YieldGard Plus with Roundup Ready corn. These products are not currently registered with the U.S. Environmental Protection Agency and are not currently available for sale or commercial use. UPON APPROVAL, this Monsanto Technology/Stewardship Agreement (limited use license) will be used and shall govern the terms and conditions for the authorized use of these products. ** As of 4/16/04, YieldGard Plus is awaiting final Japanese approval and is being distributed in 2004 pursuant to a controlled Grower Demonstration Program. Upon final Japanese approval, Monsanto plans a national launch for the 2005 growing season

5. GROWER RECEIVES FROM MONSANTO COMPANY:

A limited use license to purchase and plant seed containing Monsanto Technologies ("Seed") and apply Roundup agricultural herbicides and other authorized non-selective herbicides over the top of Roundup Ready crops. Monsanto retains ownership of the Monsanto Technologies including the genes (for example, the Roundup Ready gene) and the gene technologies. Grower receives the right to use the Monsanto Technologies subject to the conditions specified in this Agreement and for canola in a separate use agreement.

Monsanto Technologies are protected under U.S. patent law. Monsanto licenses the Grower, under applicable patents owned or licensed by Monsanto, to use Monsanto Technologies subject to the conditions listed in this Agreement. This license does not authorize Grower to plant Seed in the United States that has been purchased in another country or plant Seed in another country that has been purchased in the United States.

Enrollment in the value package called Roundup RewardsSM, designed to bring increased benefits to you.

A limited use license to prepare and apply on glyphosate-tolerant soybean, cotton, or canola crops (or have others prepare and apply) tank mixes of, or sequentially apply (or have others sequentially apply), Roundup agricultural herbicides or other glyphosate herbicides labeled for use on those crops with quizalofop, clethodim, sethoxydim, fluzafop, and/or fenoxaprop to control volunteer Roundup Ready corn in Grower's crops for the 2005 growing season. However, neither Grower nor a third party may utilize any type of co-pack or premix of glyphosate plus one or more of the above-identified active ingredients in the preparation of a tank mix.

6. GROWER UNDERSTANDS:

Grain Marketing: Grain/commodities harvested from Roundup Ready corn, YieldGard Plus with Roundup Ready corn, YieldGard Rootworm with Roundup Ready corn, YieldGard Corn Borer with Roundup Ready corn, Roundup Ready canola, and YieldGard Rootworm corn are approved for U.S. food and feed use but not yet approved in certain export markets where approval is not certain to be received before the end of 2005. As a result, Grower must direct those grain/commodities to the following approved market options: feeding on farm, use in domestic feed lots, elevators that agree to accept the grain, or other approved uses in domestic markets only. The American Seed Trade Association web site (www.amseed.org) includes a list of grain handlers' positions on accepting transgenic corn. You must complete and send to Monsanto a Market Choices® form. For additional information on grain market options or to obtain additional forms, call 1-800-768-6387.

Regulatory approvals: Monsanto Technologies may only be used within the United States where the products have been approved for use by all required governmental agencies.

Insect Resistance Management (IRM): When planting any YieldGard or Bollgard product, Grower must implement an IRM program including planting a non-Bt refuge according to the size and distance guidelines specified in the Bollgard cotton and YieldGard corn sections of the most recent Monsanto Technology Use Guide including any supplemental amendments (collectively "TUG"). Grower may lose Grower's limited use license to use these products if grower fails to follow the IRM program required by this Agreement.

Gene flow: Refer to the TUG for information on crop stewardship regarding the potential movement of pollen to neighboring crops.

7. GENERAL TERMS:

Grower's rights may not be transferred to anyone else without the written consent of Monsanto. If Grower's rights are transferred with Monsanto's consent or by operation of law, this Agreement is binding on the person or entity receiving the transferred rights. If any provision of this Agreement is determined to be void or unenforceable, the remaining provisions shall remain in full force and effect.

Grower acknowledges that Grower has received a copy of Monsanto's Technology Use Guide (TUG). To obtain additional copies of the Monsanto Technology Use Guide, contact Monsanto at 1-800-768-6387. This Agreement will remain in effect until either Grower or Monsanto choose to terminate the Agreement. Once you enroll, information regarding new and existing Monsanto Technologies and any new terms will be mailed to you each year. Your continuing use of Monsanto Technologies after receipt of any new terms constitutes your agreement to be bound by the new terms. If any provision of this Agreement is determined to be void or unenforceable, the remaining provisions shall remain in full force and effect.

8. MONSANTO'S REMEDIES:

a. Termination of License. If Grower breaches this Agreement, in addition to Monsanto's other remedies, Grower's limited-use license will terminate immediately. Thereafter, Monsanto will not accept any offer for a new Monsanto Technology/Stewardship Agreement with Grower, unless Monsanto expressly provides in writing an authorization specifically naming Grower. Any such purported agreement that does not contain Monsanto's express authorization (whether a license number has been issued or not) is void.

b. Injunction; Infringement and Contract Damages. If Grower is found by any court to have infringed one or more of the U.S. patents listed below, Grower agrees that Monsanto will be entitled to a permanent injunction enjoining Grower from making, using, selling, or offering for sale Seed and patent infringement damages to the full extent authorized by 35 U.S.C. § 283. Grower will also be liable for all breach of contract damages.

c. Attorney Fees. If Grower is found by any court to have infringed one or more of the U.S. patents listed below or otherwise to have breached this agreement, Grower agrees to pay Monsanto and the licensed Monsanto Technology provider(s) their attorneys' fees and costs.

Grower accepts the terms of the following NOTICE REQUIREMENT, LIMITED WARRANTY AND DISCLAIMER OF WARRANTY AND EXCLUSIVE LIMITED REMEDY by signing this Agreement and/or opening a bag of seed containing Monsanto Technology. If Grower does not agree to be bound by the conditions of purchase or use, Grower agrees to return the unopened bags to Grower's seed dealer.

9. NOTICE REQUIREMENT:

As a condition precedent to Grower or any other person with an interest in Grower's crop asserting any claim, action, or dispute against Monsanto and/or any seller of Seed containing Monsanto Technologies regarding performance or non-performance of Monsanto Technologies or the Seed in which it is contained, Grower must provide Monsanto a written, prompt, and timely notice (regarding performance or non-performance of the Monsanto Technologies) and to the seller of any Seed (regarding performance or non-performance of the Seed) within sufficient time to allow an in-field inspection of the crop(s) about which any controversy, claim, action, or dispute is being asserted. The notice will be timely only if it is delivered 15 days or less after the Grower first observes the issue(s) regarding performance or non-performance of the Monsanto Technology and/or the Seed in which it is contained. The notice shall include a statement setting forth the nature of the claim, name of the Monsanto Technology, and Seed hybrid or variety.

10. LIMITED WARRANTY AND DISCLAIMER OF WARRANTIES:

Monsanto warrants that the Monsanto Technologies licensed hereunder will perform as set forth in the TUG when used in accordance with directions. This warranty applies only to Monsanto Technologies contained in planting Seed that has been purchased from Monsanto and seed companies licensed by Monsanto or the seed company's authorized dealers or distributors. EXCEPT FOR THE EXPRESS WARRANTIES IN THE LIMITED WARRANTY SET FORTH ABOVE, MONSANTO MAKES NO OTHER WARRANTIES OF ANY KIND, AND DISCLAIMS ALL OTHER WARRANTIES, WHETHER ORAL OR WRITTEN, EXPRESS OR IMPLIED INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE.

11. GROWER'S EXCLUSIVE LIMITED REMEDY:

THE EXCLUSIVE REMEDY OF THE GROWER AND THE LIMIT OF THE LIABILITY OF MONSANTO OR ANY SELLER FOR ANY AND ALL LOSSES, INJURY OR DAMAGES RESULTING FROM THE USE OR HANDLING OF SEED CONTAINING MONSANTO TECHNOLOGY (INCLUDING CLAIMS BASED IN CONTRACT, NEGLIGENCE, PRODUCT LIABILITY, STRICT LIABILITY, TORT, OR OTHERWISE) SHALL BE THE PRICE PAID BY THE GROWER FOR THE QUANTITY OF THE SEED INVOLVED OR, AT THE ELECTION OF MONSANTO OR THE SEED SELLER, THE REPLACEMENT OF THE SEED. IN NO EVENT SHALL MONSANTO OR ANY SELLER BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL, SPECIAL, OR PUNITIVE DAMAGES.

Thank you for choosing our advanced technologies. We look forward to working with you in the future. If you have any questions regarding the Monsanto Technologies or this license, please call the Monsanto Customer Relations Center at: 1-800-ROUNDUP.

12. PLEASE MAIL THE SIGNED 2005 MONSANTO TECHNOLOGY/STEWARDSHIP AGREEMENT TO: Grower Licensing, Monsanto, 622 Emerson Road, Suite 150, St. Louis, MO 63141. This Monsanto Technology/Stewardship Agreement becomes effective if and when Monsanto issues the Grower a license number from Monsanto's home office in St Louis, Missouri. Monsanto does not authorize seed dealers or seed retailers to issue a license of any kind for Monsanto Technologies.

13. UNITED STATES PATENTS:

The licensed U.S. patents include: for YieldGard® Corn Borer corn – 5,484,956; 5,352,605; 5,424,412; 5,859,347; 5,593,874; 6,331,665; for YieldGard Corn Rootworm corn – 5,110,732; 6,174,724; 5,484,956; 5,352,605; 5,023,179; 6,063,597; 6,331,665; 6,501,009; for YieldGard® Plus corn – 5,023,179; 5,352,605; 5,484,956; 5,424,412; 5,859,347; 5,593,874; 6,063,597; 6,174,724; 6,331,665; for Roundup Ready® corn 2 – 4,940,835; 5,188,642; 5,359,142; 5,196,525; 5,322,938; 5,164,316; 5,352,605; 5,554,798; 5,593,874; 5,859,347; 5,424,412; 5,633,435; 5,804,425; 5,641,876; 5,717,084; 5,728,925; 6,083,878; 6,025,545; for Roundup Ready® corn – 4,940,835; 5,188,642; 6,025,545; 5,554,798; 6,040,497; 5,641,876; 5,717,084; 5,728,925; 6,083,878; for YieldGard Corn Borer with Roundup Ready® corn – 5,484,956; 5,352,605; 5,424,412; 5,859,347; 5,593,874; 6,331,665; 4,940,835; 5,188,642; 5,359,142; 5,196,525; 5,322,938; 5,164,316; 5,554,798; 5,633,435; 5,804,425; 5,641,876; 5,717,084;

5,728,925; 6,083,878; 6,025,525; for Roundup Ready® soybeans – 4,940,835; 5,188,642; 5,352,605; 5,633,435; 5,530,196; 5,717,084; 5,728,925; 5,804,425; for Roundup Ready® cotton – 5,633,435; 5,352,605; 5,530,196; 5,188,642; 4,940,835; 5,804,425, 6,051,753; 6,018,100; 5,378,619; 6,174,724; 5,159,135; 5,004,863; 5,728,925; 5,717,084; 6,083,878; for Bollgard® cotton – 5,359,142; 5,352,605; 5,530,196; 5,322,938; 5,196,525; 5,164,316; 6,174,724; 5,880,275; 5,159,135; 5,004,863; for Bollgard® with Roundup Ready® cotton – 5,633,435; 5,359,142; 5,352,605; 5,530,196; 5,322,938; 5,196,525; 5,188,642; 5,164,316; 4,940,835; 5,717,084; 5,728,925; 6,051,753; 6,018,100; 5,378,619; 6,174,724; 5,159,135; 5,004,863; 6,083,878; 5,880,275 and 5,804,425; for Bollgard® II cotton – 6,489,542; 5,359,142; 5,352,605; 5,530,196; 5,322,938; 5,196,525; 5,164,316; 6,174,724; 5,880,275; 5,159,135; 5,004,863; 5,728,925; 5,717,084; 5,338,544; 5,659,122; 5,362,865; for Bollgard® II with Roundup Ready® cotton – 5,633,435; 6,489,542; 5,359,142; 5,352,605; 5,530,196; 5,322,938; 5,196,525; 5,188,642; 5,164,316; 4,940,835; 5,717,084; 5,728,925; 6,051,753; 6,018,100; 5,378,619; 6,174,724; 5,159,135; 5,004,863; 6,083,878; 5,880,275; 5,804,425; 5,338,544; for Roundup Ready® canola – 6,051,753; 6,018,100; 5,378,619; 5,728,925; 5,776,760; 5,717,084; 5,804,425; 5,633,435; 5,627,061; 5,188,642; 4,940,835; 5,463,175; 6,083,878; for Roundup Ready® sugarbeets – 5,378,619; 5,463,175; 5,776,760; 5,633,435; 5,164,316; 5,196,525; 5,322,938; 5,359,142; 5,352,605; 5,530,196; 4,940,835; 5,188,642; 5,717,084; 5,728,925; 6,018,100; 6,051,753; 6,083,878; 5,804,425; 6,174,724; for Roundup Ready® Alfalfa – 6,051,753; 6,018,100; 5,378,619; 5,362,865; 5,659,122; 5,717,084; 5,728,925; 5,633,435; 5,804,425; for tank mix 6,239,072.

ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS. Roundup® agricultural herbicides will kill crops that do not contain the Roundup Ready® gene. Roundup®, Roundup Ready®, Bollgard®, YieldGard® and the Vine Symbol are trademarks of Monsanto Technology LLC. Roundup RewardsSM is a servicemark of Monsanto Technology LLC © 2001 Monsanto Company. Roundup Rewards applies only to Roundup branded and other specified Monsanto agricultural herbicides.

NOTES

¹ USDA Economic Research Service, *Adoption of Genetically Engineered Crops in the U.S.* (Nov. 13, 2003) available at <http://www.ers.usda.gov/data/BiotechCrops>. See also USDA Economic Research Service, *Adoption of Bioengineered Crops*, AER-810 (May 2002) available at <http://www.ers.usda.gov/publications/aer810/aer810.pdf>.

² Robert Burns, Texas A&M University, *Roundup Ready Alfalfa Promises Weed-free Hay in Southwest Fields*, SOUTHWEST FARM PRESS (April 15, 2004), available at http://southwestfarmpress.com/mag/farming_roundup_ready_alfalfa_3; see also, Harry Cline, *Benefits, Challenges of Roundup Ready Alfalfa Examined*, WESTERN FARM PRESS (Sept. 29, 2004), available at <http://westernfarmpress.com/news/9-29-04-roundup-ready-alfalfa>.

³ USDA Economic Research Service, *Economic Analysis of Adopting Liberty Link Rice*, RCS-2000 (Nov. 2000) available at <http://www.ers.usda.gov/Briefing/Rice/SpecialArticle/EcoAnalysisofadopting.pdf>.

⁴ Thomas P. Redick, *Biopharming, Biosafety, and Billion Dollar Debacles: Preventing Liability for Biotech Crops*, 8 DRAKE J. AGRIC. L. 115 (2003); Don McCabe, *Where Will We Farm Pharmacrops?*, THE FARMER/DAKOTA FARMER at 22 (March 2003); Phillip Brasher, *Biotech Corn May Have Tainted Soybeans*, DES MOINES REGISTER (Nov. 13, 2002), available at <http://desmoinesregister.com/business/stories/c4789013/19724911.html>.

⁵ POLARIS INSTITUTE, GALLOPING GENE GIANTS (FEB. 2002); DANIEL CHARLES, LORDS OF THE HARVEST: BIOTECH, BIG MONEY, AND THE FUTURE OF FOOD (2001); BILL LAMBRECHT, DINNER AT THE NEW GENE CAFÉ: HOW GENETIC ENGINEERING IS CHANGING WHAT WE EAT, HOW WE LIVE, AND THE GLOBAL POLITICS OF FOOD (2001).

⁶ *Monsanto v. McFarling*, 302 F.3d 1291, 1301 (Fed. Cir. 2002) (“McFarling I”), *cert. denied*, 537 U.S. 1232 (2003).

⁷ RONALD JAGER, THE FATE OF FAMILY FARMING: VARIATIONS ON AN AMERICAN IDEA at 205-19 (2004).

⁸ For a more detailed description of the United States’ GMO regulatory framework see Andrew C. Fish, *Guide to U.S. Regulation of Genetically Modified Food and Agricultural Biotechnology Products*, Pew Initiative on Food and Biotechnology (Sept. 7, 2001), available at <http://pewagbiotech.org/resources/issuebriefs/1-regguide.pdf>; Blake A. Biles, *Agricultural Biotechnology: The U.S. Perspective*, NATURAL RESOURCES AND ENVIRONMENT (Summer 2003). The White House has announced a new proposed plan to further regulate GMOs. Ann Hazlett, *White House Announces Plan to Further Regulate Genetically-Modified Crops*, AGRIC. L. UPDATE, Sept. 2002, at 4.

⁹ The three federal agencies operate under the Coordinated Framework for Regulation of Biotechnology, which sets out the policies for regulating GMO products. Coordinated Framework for Regulation of Biotechnology, 51 Fed. Reg. 23302 (June 26, 1986). See also Donald L. Uchtmann, *Regulating Foods Derived from Genetically Engineered Crops*, AGRIC. L. UPDATE, May 2000, at 4.

¹⁰ Michael Taylor & Judy Tick, *Post-Market Oversight of Biotech Foods: Is the System Prepared?* Pew Initiative on Food and Biotechnology at 12-26 (April 2003), available at <http://pewagbiotech.org/research/postmarket/PostMarket.pdf>.

¹¹ 7 U.S.C. §§ 7701 to 7772.

¹² Introduction of Organisms and Products Altered or Produced Through Genetic Engineering Which are Plant Pests or Which There is Reason to Believe are Plant Pests, 7 C.F.R. pt. 340 (2004).

¹³ 7 C.F.R. §§ 340.3, 340.4 (2004).

¹⁴ 7 C.F.R. § 340.6 (2004).

-
- ¹⁵ 7 C.F.R. § 340.6 (2004).
- ¹⁶ 7 C.F.R. pt. 340 (2004). The legal term is that the GM plant is “deregulated.”
- ¹⁷ Michael Taylor & Judy Tick, *Post-Market Oversight of Biotech Foods: Is the System Prepared?*, Pew Initiative on Food and Biotechnology at 17 (April 2003), available at <http://pewagriotech.org/research/postmarket/PostMarket.pdf>.
- ¹⁸ 7 U.S.C. §§ 136 *et seq.*
- ¹⁹ Procedures and Requirements for Plant-Incorporated Protectants, 40 C.F.R. § 174.3 (2004).
- ²⁰ Neil D. Hamilton, *Legal Issues Shaping Society’s Acceptance of Biotechnology and Genetically Modified Organisms*, 6 DRAKE J. AGRIC. L. 81, 92-96 (2001).
- ²¹ 7 U.S.C. § 136a(c)(5). The pesticide may not cause “unreasonable adverse effects on the environment”. Adverse effects on the environment are defined in 7 U.S.C. § 136(bb) as: “(1) any unreasonable risk to man or the environment, taking into account the economic, social, and environmental costs and benefits of the use of any pesticide, or (2) a human dietary risk from residues that result from a use of a pesticide in or on any food inconsistent with the standard under section 408 of the Federal Food, Drug, and Cosmetic Act (21 U.S.C. § 346a).”
- ²² 7 U.S.C. § 136a(a).
- ²³ 7 U.S.C. § 136a(c)(5).
- ²⁴ 21 U.S.C. § 346a.
- ²⁵ 21 U.S.C. §§ 301 *et seq.*
- ²⁶ Emily Marden, *Risk and Regulation: U.S. Regulatory Policy on Genetically Modified Food and Agriculture*, 44 B.C. L. REV. 733, 780 (May 2003).
- ²⁷ General Accounting Office, *Genetically Modified Foods: Experts View Regimen of Safety Tests as Adequate, but FDA’s Evaluation Process Could Be Enhanced*, GAO-02-566 (May 2002).
- ²⁸ NATIONAL ACADEMY OF THE SCIENCES, *SAFETY OF GENETICALLY ENGINEERED FOODS: APPROACHES TO ASSESSING UNINTENDED HEALTH EFFECTS* at 129-32, 175-87 (2004), available at <http://www.nap.edu/openbook/0309092094/html>.
- ²⁹ Statement of Policy: Foods Derived from New Plant Varieties, 57 Fed. Reg. 22,984 (May 29, 1992). For example, in approving Monsanto’s Bt corn consultation, FDA relied on Monsanto’s own findings. Letter from Alan M. Rulis, Director, Office of Premarket Approval Center for Food Safety and Applied Nutrition, Dep’t of Health and Human Services, to Kent Croon, Regulatory Affairs Manager, Monsanto Co. (Sept. 25, 1995), available at <http://www.cfsan.fda.gov/~acrobot2/bnfl034.pdf>.
- ³⁰ Premarket Notice Concerning Bioengineered Foods, 66 Fed. Reg. 4706 (Jan. 18, 2001).
- ³¹ Draft Guidance for Industry: Voluntary Labeling Indicating Whether Foods Have or Have Not Been Developed Using Bioengineering; Availability, 66 Fed. Reg. 4839 (Jan. 18, 2001).
- ³² Food and Drug Administration, Docket No. 00P-1211/CP1 (Mar. 21, 2000).
- ³³ Neil Hamilton, *Why Own the Farm If You Can Own the Farmer (and the Crop)?: Contract Production and Intellectual Property Protection of Grain Crops*, 73 NEBR. L. REV. 48, 89-94 (1994).
- ³⁴ According to Monsanto, this is a benefit to both farmers and seed companies. Monsanto Co., *Seed Trait Stewardship*, at

http://www.monsanto.com/monsanto/us_ag/content/stewardship/training/course/content/lesson3/mon01_103t02p01.htm.

³⁵ Monsanto Co., *2005 Technology/Stewardship Agreement* at para. 7, General Terms.

³⁶ J.W. Looney & Anita K. Poole, *Adhesion Contracts, Bad Faith and Economically Faulty Contracts*, 4 DRAKE J. AGRIC. L. 177 (1999).

³⁷ Monsanto Co., *2005 Technology/Stewardship Agreement*.

³⁸ *Monsanto v. Dawson*, No. 4:98CV02004, 2000 U.S. Dist. LEXIS 22392 (E.D. Mo. Nov. 24, 2000) (unpublished).

³⁹ For a good checklist of things farmers should consider before signing a grain contract of any type see Iowa Attorney General's *Grain Production Contract Checklist* (1999), available at http://www.state.ia.us/government/ag/working_for_farmers/brochures/grain_production.html.

⁴⁰ See generally Nicole C. Nachtigal, *A Modern David and Goliath Farmer v. Monsanto: Advising a Grower on the Monsanto Technology Agreement 2001*, 6 GREAT PLAINS NAT. RESOURCES J. 50 (2001).

⁴¹ Monsanto Co., *2005 Technology/Stewardship Agreement* at para. 4, Grower Agrees.

⁴² Monsanto Co., *2005 Technology/Stewardship Agreement* at para. 4, Grower Agrees.

⁴³ 5 U.S.C. § 552a(b); *Doe v. Veneman*, 380 F.3d 807 (5th Cir. 2004).

⁴⁴ *Monsanto v. Trantham*, 156 F. Supp. 2d 855 (W.D. Tenn. 2001) (holding that a Tennessee cotton and soybean farmer infringed on Monsanto's patent by saving seed).

⁴⁵ Monsanto Co., *2005 Technology Use Guide*, at A Message About Seed Stewardship, at http://www.monsanto.com/monsanto/us_ag/content/stewardship/tug/tug2005.pdf. Monsanto's 2005 Technology/Stewardship Agreement is currently not yet available on Monsanto's website.

⁴⁶ Monsanto claims seed companies receive hundreds of calls each year regarding patent violations. Monsanto Co., *Seed Trait Stewardship*, at http://www.monsanto.com/monsanto/us_ag/content/stewardship/training/course/content/lesson2/mon01_102t01p08.htm (accompanying audio).

⁴⁷ NATIONAL ACADEMY OF THE SCIENCES, GENETICALLY MODIFIED PEST-PROTECTED PLANTS: SCIENCE AND REGULATION § 2.9 (2000), available at <http://books.nap.edu/books/0309069300/html>; Gregory Jaffe, *Planting Trouble: Are Farmers Squandering Bt Corn Technology—An Analysis of USDA Data Showing Significant Noncompliance with EPA's Refuge Requirements*, Center for Science in the Public Interest (June 2003), available at http://www.cspinet.org/new/pdf/bt_corn_report.pdf.

⁴⁸ For farmers using YieldGard Rootworm corn, Monsanto defines a refuge as "simply a block or strip of corn that does not contain B.t. technology for control of western, northern or Mexican corn rootworm." The TUG does allow the application of some non-Bt insecticides. Monsanto Co., *2005 Technology Use Guide*, at 5.

⁴⁹ Monsanto Co., *2005 Technology Use Guide*, at 5.

⁵⁰ Justin Gillis, *Some Farmers Not Following Rules For Biotech Corn: Crops' Usefulness Is at Risk*, WASHINGTON POST at E4 (June 19, 2003).

⁵¹ Andrew Burchett, *Bt Cops: Seed companies have a new job—policing your use of Bt corn*, FARM JOURNAL at 16 (Feb. 2003). The article describes how EPA is requiring enforcement of Bt crop refuges. If companies do not comply, EPA can withdraw the company's registration, therefore revoking the ability to sell the GMO trait.

⁵² Monsanto Co., *2005 Technology Use Guide*, at 1. There is a similar monitoring program in place for Monsanto's Bollgard Cotton. Monsanto Co., *2005 Technology Use Guide*, at 19.

⁵³ 7 U.S.C. § 1361(a)(1). *See also*, Scott Kilman, *EPA May Fine Units of DuPont, Dow Chemical for Seed Trials in Hawaii*, WALL STREET JOURNAL (Aug. 14, 2002) (reporting that DuPont subsidiary Pioneer and Dow Chemical were facing fines of \$5,500 each for violating EPA rules on field trials involving pesticide resistant GMOs).

⁵⁴ General Accounting Office, *International Trade: Concerns Over Biotechnology Challenge U.S. Agricultural Exports*, GAO-01-727 (June 2001).

⁵⁵ Monsanto Co., *2005 Technology/Stewardship Agreement* at para. 7, General Terms.

⁵⁶ U.S. Request for WTO Panel on European Biotech Moratorium (Aug. 18, 2003), *available at* <http://www.state.gov/e/eb/rls/rm/2003/23372.htm>.

⁵⁷ Monsanto Co., *2005 Technology Use Guide*, at 15. Monsanto's TUG Grain Stewardship section states: "The United States regulatory agencies granted full approval to corn containing the Roundup Ready, YieldGard Rootworm (including all stacks e.g., YieldGard Plus), traits for commerce within the U.S. including approval for marketing and consumption as food, food ingredients, and feed for livestock. These products also have food and feed approval in Japan and Canada. However, regulatory approval for grain/commodities harvested containing Roundup Ready, YieldGard Rootworm, or YieldGard Plus, is pending in the European Union. As a result, the grower is required to find a market that does not ship this grain or products processed from this grain to the European Union."

⁵⁸ Monsanto Co., *2005 Technology/Stewardship Agreement* at para. 6, Grower Understands.

⁵⁹ Robert Schubert, *Are Roundup Ready Soybeans Pushing Out Conventional Varieties?*, CropChoice (March 28, 2001) at <http://cropchoice.com/leadstry.asp?recid=270> (describing the story of Tom and Gail Wiley's market rejection of organic soybeans due to GMO contamination).

⁶⁰ Donald L. Uchtmann, *StarLink—A Case Study of Agricultural Biotechnology Regulation*, 7 DRAKE J. AGRIC. L. 159 (Spring 2002); Amelia P. Nelson, *Legal Liability in the Wake of StarLink: Who Pays in the End*, 7 DRAKE J. AGRIC. L. 241 (Spring 2002); Rebecca M. Bratspies, *Myths of Voluntary Compliance: Lessons from the StarLink Corn Fiasco*, 27 WM. & MARY ENVTL. L & POL'Y REV. 593 (Spring 2003).

⁶¹ Lonie Boens, *Glyphosate-Resistant Soybeans: An Introduction*, 6 GREAT PLAINS NAT. RESOURCES J. 36 (Fall 2001).

⁶² Monsanto Co., *2005 Technology/Stewardship Agreement* at para. 4, Grower Agrees.

⁶³ In addition to Roundup, Monsanto allows select other herbicides to be used and still qualify for Roundup Rewards benefits including Field Master™, Ready Master™ ATZ, RT Master™ and Fallow Master™. Monsanto Co., *2005 Technology Use Guide*, at 24.

⁶⁴ Monsanto Roundup Rewards Brochure: 2005 Protecting Your Trait and Herbicide Investments. According to Monsanto's website, since 1997, 180,000 growers have participated in Roundup Rewards and the program has provided more than \$341 million in program benefits. Monsanto Co., *Roundup Rewards*, *available at* http://www.monsanto.com/monsanto/us_ag/layout/crop_pro/r_rewards/default.asp.

⁶⁵ Rhonda Brooks, *Revival of the Fittest*, FARM INDUSTRY NEWS (Dec. 1, 2001). In the article, a Monsanto market manager is quoted as saying: "We don't cover imitator products. Growers must use our technology for the benefits."

⁶⁶ Monsanto Co., *2005 Technology/Stewardship Agreement* at para. 11, Grower's Exclusive Limited Remedy.

⁶⁷ For example, the Idaho Supreme Court held that limiting damage awards in an herbicide contract was unconscionable and therefore unenforceable. *Walker v. American Cyanamid Co.*, 948 P.2d 1123, 1130 (Idaho 1999). A Kentucky federal court upheld an herbicide contract provision that limited a farmer's damages because "it is appropriate to shift the risk of loss to the farmer in this situation given the many uncertainties and variables that exist in the farming business." *Gooch v. E.I. Du Pont De Nemours & Co.*, 40 F. Supp. 2d 863, 872 (W.D. Ky. 1999). See also Scott S. Partridge, *The Use of the Class Action Device in Agricultural Products Litigation*, 6 DRAKE J. AGRIC. L. 175, 188 (2001) (describing why class actions based on GMO technology are difficult to pursue because each farmer has a different set of growing conditions); Gaby R. Jabbour, *Class Certification Order Reversed in Suit Against Monsanto and Others*, National AgLaw Center (June 2003), available at <http://www.nationalaglawcenter.org/assets/archivecases/monsanto-davis.html> (describing a Texas case where class certification was denied due to defenses that were peculiar to individual farmers).

⁶⁸ *Monsanto v. McFarling*, 302 F.3d 1291 (Fed. Cir. 2002), cert. denied, 537 U.S. 1232 (2003).

⁶⁹ *Monsanto v. Swann*, No. 4:00-CV-1481, 2003 U.S. Dist. LEXIS 5338 (E.D. Mo. Jan. 8, 2003) (unpublished) (court applied Missouri law to Monsanto's breach of its Technology Agreement claim); Gaby R. Jabbour, *Monsanto Sues Farmer for Patent Infringement and Breach of Contract*, National AgLaw Center (July 2003), available at <http://www.nationalaglawcenter.org/assets/archivecases/monsanto-swann.html>.

⁷⁰ GARRY WILLS, *A NECESSARY EVIL: A HISTORY OF AMERICAN DISTRUST OF GOVERNMENT* (1999).

⁷¹ *Monsanto Co., 2005 Technology/Stewardship Agreement* at para. 3, Forum Selection for Non-Cotton Claims Made by Grower and All Other Claims.

⁷² *McNair v. Monsanto*, 279 F. Supp. 2d 1290 (M.D. Ga. 2003) (transferring to Missouri cotton farmers' lawsuit that asserted defects in seed sold by Delta and Pine Land and containing Monsanto technology).

⁷³ See, for example, *Monsanto v. McFarling*, 302 F.3d 1291 (Fed. Cir. 2002), cert. denied, 537 U.S. 1232 (2003) ("McFarling I"); *Ex parte Monsanto Co.*, No. 1001766, 2002 Ala. LEXIS 12 (Jan. 18, 2002), opinion withdrawn, 2002 Ala. LEXIS 301 (Oct. 1, 2002); *Monsanto v. White*, No. 4:00CV1761, 2001 U.S. Dist. LEXIS 25135 (E.D. Mo. June 22, 2001) (unpublished); *Monsanto v. Dawson*, No. 4:98CV02004, 2000 U.S. Dist. LEXIS 22391 (E.D. Mo. Aug. 18, 2000) (unpublished); *Massey v. Monsanto*, No. 2:99CV218-P-B, 2000 U.S. Dist. LEXIS 11305 (N.D. Miss. June 13, 2000) (unpublished); *Monsanto v. Godfredson*, No. 4:99CV1691, 2000 U.S. Dist. LEXIS 22383 (E.D. Mo. Apr. 13, 2000) (unpublished).

⁷⁴ The farmers have a web site about their case, at <http://nelsonfarm.net>.

⁷⁵ *Monsanto v. Nelson*, No. 4:00-CV-1636, 2001 U.S. Dist. LEXIS 25132 (E.D. Mo. Sept. 10, 2001) (unpublished).

⁷⁶ CropChoice News, *Monsanto Settles with Nelsons in Soybean Seed Dispute* (Nov. 1, 2001) at <http://cropchoice.com/leadstry.asp?recid=504>. Confidential settlement agreements appear common in disputes between farmers and Monsanto. See Todd D. Epp, *Four-Wheeling Through the Soybean Fields of Intellectual Property Law: A Practitioner's Perspective*, 43 WASHBURN L.J. 669, 675-76 (Spring 2004).

⁷⁷ *Monsanto v. Bandy*, No. 4:04CV00708 ERW (E.D. Mo. filed June 8, 2004).

⁷⁸ Courts have held that binding arbitration provisions are not always enforceable by companies. A recent Arkansas Supreme Court decision held that Tyson's binding arbitration clause in a hog production contract was not enforceable because the contract was too one-sided in favor of Tyson. *Tyson Foods, Inc. v. Archer*, No. 03-649, 2004 Ark. LEXIS 107 (Ark. Feb. 19, 2004); *Archer v. Tyson Foods*, No. CIV-2002-497 (Ark. Cir. Ct. Feb. 21, 2003), available at http://www.hwinn.com/news_articles/order_Arbitration.pdf. See also *Sanderson Farms v. Gatlin*, 848 So.2d 828 (Miss. 2003) (holding that when a chicken processor breached the production contract's arbitration provision, the processor waived its right to arbitration).

⁷⁹ Randi Ilyse Roth, *Redressing Unfairness in the New Agricultural Labor Arrangements: An Overview of Litigation Seeking Remedies for Contract Poultry Growers*, 25 U. MEM. L. REV. 1207, 1230 (Spring 1995).

⁸⁰ Monsanto Co., *2005 Technology/Stewardship Agreement* at para. 2, Binding Arbitration for Cotton-Related Claims Made By Growers.

⁸¹ Randi Ilyse Roth, *Redressing Unfairness in the New Agricultural Labor Arrangements: An Overview of Litigation Seeking Remedies for Contract Poultry Growers*, 25 U. MEM. L. REV. 1207, 1230 (Spring 1995).

⁸² In *Monsanto v. Swann*, a federal court in Missouri held that a provision in Monsanto's 1998 Technology Agreement setting liquidated damages was enforceable and held that the farmer must pay the 1998 technology fee for each misused bag of seed, multiplied by 120. *Monsanto v. Swann*, No. 4:00-CV-1481, 2003 U.S. Dist. LEXIS 5338 (E.D. Mo. Jan. 8, 2003) (unpublished).

⁸³ Monsanto Co., *2005 Technology/Stewardship Agreement* at para. 8, Monsanto's Remedies.

⁸⁴ In one case involving Roundup Ready cotton, a federal judge determined that Monsanto's total damages and costs for 424.5 bags of cottonseed unlawfully retained was \$592,677.89. *In re Trantham*, 286 B.R. 650 (Bankr. W.D. Tenn. 2002), *rev'd* 304 B.R. 298 (B.A.P. 6th Cir. 2004) (holding that Monsanto's entire judgment for willful patent infringement is nondischargeable in bankruptcy). Monsanto lists recent enforcement actions against farmers on its website that include a \$1,500,000 settlement agreement and a \$780,000 court judgment. Monsanto Co., *Seed Trait Stewardship*, at http://www.monsanto.com/monsanto/us_ag/content/stewardship/training/course/content/lesson2/mon01_102t02p15.htm

⁸⁵ Donald L. Uchtmann, *Can Farmers Save Roundup Ready Beans for Seed? McFarling and Trantham Cases Say No*, AGRIC L. UPDATE, Oct. 2002, at 4.

⁸⁶ *Monsanto Co. v. McFarling*, 363 F.3d 1336, 1344 (Fed. Cir. 2004) ("McFarling II"), *petition for cert. filed*, No. 04-31 (U.S. July 6, 2004).

⁸⁷ *McFarling II*, 363 F.3d at 1347-52.

⁸⁸ *McFarling II*, 363 F.3d at 1352.

⁸⁹ Robert Schubert, *Mississippi Farmer Gets Big Break From Appeals Court in Monsanto Biotech Seed Case*, CropChoice (April 27, 2004) at <http://www.cropchoice.com/leadstry.asp?recid=2540>.

⁹⁰ Keith Aoki, *Traditional Knowledge, Intellectual Property, and Indigenous Culture: Article: Weeds, Seeds, and Deeds: Recent Skirmishes in Seed Wars*, 11 CARDOZO J. INT'L & COMP. L. 247, 257-276 (Summer 2003), available at <http://www.law.uoregon.edu/faculty/kaoki/site/articles/weedsandseeds.pdf>.

⁹¹ Samantha M. Ohlgart, *The Terminator Gene: Intellectual Property Rights vs. the Farmers' Common Law Right to Save Seed*, 7 DRAKE J. AGRIC. L. 473 (Summer 2002).

⁹² 7 U.S.C. §§ 2321 *et seq.*

⁹³ 7 U.S.C. § 2543.

⁹⁴ *Asgrow Seed Co. v. Winterboer*, 513 U.S. 179, 192 (1995). In *Asgrow Seed*, soybean farmers in northwest Iowa brown-bagged a sizable portion of their crops for resale to other farmers. Asgrow sued the farmers seeking damages and a permanent injunction against the sale of the protected seed. The farmers defended their right to resell the soybean seed based on the seed saving exemption of the PVPA. The Supreme Court disagreed and held that the statute allowed farmers to save seed only for their next crop. For more information on the *Asgrow Seed* case, see Nathan A. Busch, *Jack and the Beanstalk: Property Rights in Genetically Modified Plants*, 3 MINN. INTELL. PROP. REV. 1, 69-73 (2002), available at <http://mipr.umn.edu/archive/v3n2/busch.pdf>.

⁹⁵ *Diamond v. Chakrabarty*, 447 U.S. 303 (1980).

⁹⁶ *Ex Parte Hibberd*, 227 U.S.P.Q. 443 (Bd. Pat. App. & Int. 1985). The Patent Board's decision states that: "In our view, the Supreme Court's analysis of the legislative history of the plant-specific Acts makes it clear that the legislative intent of these acts was to extend patent protection to plant breeders who were stymied by the two noted obstacles."

⁹⁷ *J.E.M. Ag Supply v. Pioneer Hi-Bred Int'l*, 534 U.S. 124 (2001); Kevin M. Baird, *Pioneer Hi-Bred International v. J.E.M. Ag Supply: Patent Protection of Plants Grows Under the Supreme Court's Latest Decision*, 2002 U. ILL. J.L. TECH. & POL'Y 269 (Spring 2002); Michael T. Roberts, *J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred International, Inc.: Its Meaning and Significance for the Agricultural Community*, National AgLaw Center (Nov. 2002), available at http://www.nationalaglawcenter.org/assets/articles/roberts_jem.pdf.

⁹⁸ On behalf of the American Corn Growers Association and National Farmers Union, the International Center for Technology Assessment (CTA) filed a "friend of the court" brief in this case in support of J.E.M.'s position. In the brief, these organizations argued that the Patent and Trademark Office's granting of general utility patents on seeds is unlawful and has curtailed research into improved plant varieties, brought higher seed prices for farmers, and contributed to consolidation in the seed industry.

⁹⁹ *Monsanto Co. v. McFarling*, 363 F.3d 1336, 1344 (Fed. Cir. 2004) ("McFarling II"), *petition for cert. filed*, No. 04-31 (U.S. July 6, 2004) ("In light of the Supreme Court's interpretation [in *J.E.M. Ag Supply*] of Congress's intent, we conclude that Congress did not intend to prohibit owners of utility patents from enforcing seed-saving prohibitions in their licenses."). Monsanto informs farmers on its website that the Patent Law, unlike the PVPA, does not allow "infringement" by farmers who save and reuse seed. *Monsanto Co., Seed Trait Stewardship*, at http://www.monsanto.com/monsanto/us_ag/content/stewardship/training/course/content/lesson2/mon01_102t01p11.htm.

¹⁰⁰ In a seed saving dispute, a farmer from Mississippi is challenging the validity of one of Monsanto's patents (No. 5,633,435) in federal court. See Robert Schubert, *Monsanto's '435 Patent: Now You See It, Now You Don't*, CropChoice (July 1, 2004) at <http://www.cropchoice.com/leadstry.asp?recid=2634>.

¹⁰¹ Pioneer directs that for its 2003 soybean varieties farmers refer to the seed labels. Pioneer Hi-Bred International, Inc., *Characteristic Ratings of Pioneer Brand Soybean Varieties for 2004* at 2, at <http://www.pioneer.com/Products/PrdGuide/GA/050/charts/TRGA50AG.pdf>.

¹⁰² One federal judge in a patent infringement case stated in a concurring opinion that farmers would not be liable for patent infringement just because GM seed blew onto their property. *SmithKline Beecham Co. v. Apotex Co.*, 365 F.3d 1306, 1330-31 (Fed. Cir. 2004) (Gajarsa, J., concurring) ("Consider, for example, what might happen if the wind blew fertile, genetically modified blue corn protected by a patent, from the field of a single farmer into neighboring cornfields. The harvest from those fields would soon contain at least some patented blue corn mixed in with the traditional public domain yellow corn--thereby infringing the patent. The wind would continue to blow, and the patented crops would spread throughout the continent, thereby turning most (if not all) North American corn farmers into unintentional, yet inevitable, infringers. The implication—that the patent owner would be entitled to collect royalties from every farmer whose cornfields contained even a few patented blue stalks—cannot possibly be correct."). See also, Robert Schubert, *Federal Judge's Opinion Shows Understanding of Patented Gene Spread*, CropChoice (May 17, 2004), available at <http://www.cropchoice.com/leadstry.asp?RecID=2560>.

¹⁰³ Ind. Code § 15-4-14-11, available at <http://www.ai.org/legislative/ic/code/title15/ar4/ch14.html>.

¹⁰⁴ Drew Kershen, *Of Straying Crops and Patent Rights*, 43 WASHBURN L.J. 575, 587 (Spring 2004).

¹⁰⁵ *Monsanto Canada, Inc. v. Schmeiser*, No. T-1593-98, 2001 FTC 256 (Trial Div. Mar. 29, 2001) available at <http://decisions.fct-cf.gc.ca/fct/2001/2001fct256.html>; see also, Hilary Preston, *Drift of*

Patented Genetically Engineered Crops: Rethinking Liability Theories, 81 TEX. L. REV. 1153 (March 2003).

¹⁰⁶ Schmeiser v. Monsanto Canada, Inc., No. A-367-01, 2002 FCA 309 (Fed. Ct. Sept. 4, 2002), available at <http://decisions.fct-cf.gc.ca/fct/2002/2002fca309.html>.

¹⁰⁷ Schmeiser v. Monsanto Canada, Inc., No. 29437, 2004 SCC 34 (Can. Jan. 20, 2004), available at <http://www.lexum.umontreal.ca/csc-scc/en/rec/html/2004scc034.wpd.html>.

¹⁰⁸ Schmeiser, 2004 SCC 34 at 86.

¹⁰⁹ Schmeiser, 2004 SCC 34 at 95.

¹¹⁰ Schmeiser, 2004 SCC 34 at 95.

¹¹¹ Schmeiser, 2004 SCC 34 at 96.

¹¹² Schmeiser, 2004 SCC 34 at 97.

¹¹³ Schmeiser, 2004 SCC 34 at 103-05.

¹¹⁴ Schmeiser, 2004 SCC 34 at 106. See also, E. Ann Clark, *So, Who Really Won the Schmeiser Decision?*, CropChoice (June 13, 2004), available at <http://www.cropchoice.com/leadstry.asp?recid=2612>.

¹¹⁵ Robert Schubert, *Monsanto Goes After Indiana Farmer*, CropChoice (Sept. 25, 2001), available at <http://www.cropchoice.com/leadstry.asp?recid=470>.

¹¹⁶ Stratemeyer v. Monsanto Co., First Amended Complaint, No. 02-CV-505-MJR (S.D. Ill. filed Feb. 11, 2004). Monsanto has moved to dismiss the case on the grounds that the farmer lacks standing and fails to allege any potential injury. See Monsanto's Memorandum in Support of Its Motion to Dismiss Plaintiff's First Amended Complaint Pursuant to Federal Rule of Civil Procedure 12(b)(1) and 12(b)(6) (S.D. Ill. filed March 1, 2004).

¹¹⁷ *In re Wood*, 309 B.R. 745, 748 (Bankr. W.D. Tenn. 2004) (the farmer was held liable for patent infringement for saving seed despite not signing Monsanto's Technology Agreement; Monsanto was awarded damages of \$56,912 for patent infringement plus over \$400,000 in attorneys fees and costs).

¹¹⁸ David R. Moeller, *State Legislative Activity on GMOs*, 18 FARMERS' LEGAL ACTION REPORT 3 (2003). Some bills and laws regulating GMOs have been alleged to violate the dormant Commerce Clause of the U.S. Constitution. David Moeller, *State GMO Restrictions and the Dormant Commerce Clause*, AGRIC L. UPDATE Aug. 2001, available at <http://www.flaginc.org/pubs/arts/GMOrestrict.pdf>. See also, John S. Harbison, *The War on GMOs: A Report from the Front*, National AgLaw Center (August 2004), available at http://www.nationalaglawcenter.org/assets/article_harbison_gmos.pdf.

¹¹⁹ Ind. Code § 15-4-13-11, available at <http://www.in.gov/legislative/ic/code/title15/ar4/ch13.html>.

¹²⁰ S.D. Codified Laws § 38-1-45.

¹²¹ S.D. Codified Laws § 38-1-46.

¹²² N.D. Cent. Code § 4-24-13 (H.B. 1442) available at <http://www.state.nd.us/lr/cencode/t04c24.pdf>.

¹²³ Neil Harl, *The StarLink Situation*, Iowa Grain Quality Initiative at 6 (Nov. 18, 2003), available at <http://www.extension.iastate.edu/Pages/grain/publications/buspub/0010star.PDF>.

¹²⁴ J.G. Waines and S.G. Hedge, *Intraspecific Gene Flow in Bread Wheat as Affected by Reproductive Biology and Pollination Ecology of Wheat Flowers*, 43 CROP SCIENCE 451-463 (2003).

-
- ¹²⁵ NATIONAL ACADEMY OF THE SCIENCES, BIOLOGICAL CONFINEMENT OF GENETICALLY ENGINEERED ORGANISMS at 35-64, 194-95 (2004), available at <http://www.nap.edu/books/0309090857/html>.
- ¹²⁶ Adam W. Jones, *What Liability of Growing Genetically Engineered Crops?*, 7 DRAKE J. AGRIC. L. 621, 626-27 (2002).
- ¹²⁷ Margaret Rosso Grossman, *Genetically Modified Crops in the United States: Federal Regulation and State Tort Liability*, 5 ENVIRONMENTAL LAW REVIEW 86-108 (2003); Drew Kershen, *Legal Liability Issues in Agricultural Biotechnology*, National AgLaw Center (Nov. 2002), available at http://www.nationalaglawcenter.org/assets/articles/kershen_biotech.pdf; Jane Matthews Glenn, *Footloose: Civil Responsibility for GMO Gene Wandering in Canada*, 43 WASHBURN L.J. 547 (Spring 2004).
- ¹²⁸ Monsanto Co., *2005 Technology Use Guide* at 15. See also *2005 Technology Use Guide* at 17 discussing pollen movement.
- ¹²⁹ Roger A McEowen, *Legal Issues Related to the Use and Ownership of Genetically Modified Organisms*, 43 WASHBURN L.J. 611, 626-27 (Spring 2004).
- ¹³⁰ *Sample v. Monsanto Co.*, 283 F. Supp. 2d 1088, 1093 (E.D. Mo. 2003), *appeal filed*, *McIntosh v. Monsanto Co.*, No. 03-3993 (8th Cir. 2004).
- ¹³¹ *In re StarLink Corn Prods. Liability Litig.*, 212 F. Supp. 2d 828, 842 (N.D. Ill. 2002).
- ¹³² American Association of Insurance Providers, *Breaking New Ground: Harmful or Not, Genetically Engineered Food Could Lead to Knotty Claims*, 26 VIEWPOINT 2 (Fall 2001), available at <http://www.aaisonline.com/Viewpoint/01fall2.html>.
- ¹³³ Richard A. Repp, *Biotech Pollution: Assessing Liability for Genetically Modified Crop Production and Genetic Drift*, 36 IDAHO L. REV. 585, 600-05 (2000), available at <http://www.worc.org/foodfight/liability-IDlawjournal.html>.
- ¹³⁴ *Borland v. Sanders Lead Co.*, 369 So.2d 523, 527-29 (Ala. 1979) (court upheld trespass claim where lead company's particles damaged farmland); *Public Service Co. of Colorado v. Van Wyk*, 27 P.3d 377 (Colo. 2001) (trespass can take many forms including throwing, propelling, or placing a thing either on or beneath the surface of the land, or in the air and space above it).
- ¹³⁵ Stephen M. Scanlon, *Should Missouri Farmers of Genetically Modified Crops Be Held Liable for Genetic Drift and Cross-Pollination?*, 10 MO. ENVTL. L & POL'Y REV. 1, 8 (2002).
- ¹³⁶ 275 P.2d 959 (Idaho 1954); see also, *Schronk v. Gilliam*, 380 S.W.2d 743 (Tex. Civ. App. 1964); *Cross v. Harris*, 370 P.2d 703 (Ore. 1962).
- ¹³⁷ STUART M. SPEISER, THE LAW OF TORTS, § 23:7 (1990).
- ¹³⁸ Thomas P. Redick & Christina G. Bernstein, *Nuisance Law and the Prevention of "Genetic Pollution": Declining a Dinner Date with Damocles*, 30 ENVTL. L. REP. 10328, 10336 (2000).
- ¹³⁹ RESTATEMENT (SECOND) OF TORTS § 821D (1977); Minn. Stat. § 561.01.
- ¹⁴⁰ 172 N.W.2d 647, 654 (Wis. 1969); see also *Miles v. A. Arena & Co.*, 73 P.2d 1260 (Cal. Ct. App. 1937) (nuisance existed when pesticide drifted during crop dusting, killing honey bees).
- ¹⁴¹ John P. Mandler & Kristin R. Eads, *Liability Exposure to Seed Companies from Adventitious GMO Pollination Due to Pollen Drift Resulting in Cross Pollination or Outcrossing*, Faegre & Benson at 14 (Jan. 26, 2000), available at <http://www.faegre.com/downloads/gmo.doc>.
- ¹⁴² In some states, farmers and farm operations could claim they are protected from nuisance lawsuits by neighbors due to right-to-farm statutes. Margaret Rosso Grossman & Thomas G. Fischer, *Protecting the*

Right to Farm: Statutory Limits on Nuisance Actions Against the Farmer, 1983 WIS. L. REV. 95 (1983); Alexander A. Reinert, *The Right to Farm: Hog-Tied and Nuisance-Bound*, 73 N.Y.U.L. REV. 1694 (1998); Goodell v. Humbolt County, 575 N.W.2d 486 (Iowa 1998). However, the Iowa Supreme Court recently struck down Iowa's right-to-farm statute as a taking of property without compensation under Iowa's Constitution. See Gacke v. Pork Extra, L.L.C., 684 N.W.2d 168 (Iowa 2004).

¹⁴³ Marc C. Mayerson, *Insurance Recovery for Losses from Contaminated or Genetically Modified Foods*, 39 TORTS & INS. L.J. 837 (Spring 2004).

¹⁴⁴ Richard A. Repp, *Biotech Pollution: Assessing Liability for Genetically Modified Crop Production and Genetic Drift*, 36 IDAHO L. REV. 585, 613-16 (2000).

¹⁴⁵ Maryland Heights Leasing, Inc. v. Mallinckrodt, Inc., 706 S.W.2d 218, 223 (Mo. Ct. App. 1986); see also Faber v. Asplundh Tree Expert Co., 810 P.2d 384 (Ore. Ct. App. 1991); McGraw v. Weeks, 930 S.W.2d 365 (Ark. 1996); Lawler v. Skelton, 130 So.2d 565 (Miss. 1961).

¹⁴⁶ John P. Mandler & Kristin R. Eads, *Liability Exposure to Seed Companies from Adventitious GMO Pollination Due to Pollen Drift Resulting in Cross Pollination or Outcrossing*, Faegre & Benson at 9 (Jan. 26, 2000), available at <http://www.faegre.com/downloads/gmo.doc>.

¹⁴⁷ Stephen Kelly Lewis, "Attach of the Killer Tomatoes?" *Corporate Liability for the International Propagation of Genetically Altered Agricultural Products*, 10 TRANSNAT'L L. 153 (Spring 1997).

¹⁴⁸ For example, in pesticide drift cases courts require evidence that damage to neighboring farms was caused by the pesticides. Kleiss v. Cassida, 696 N.E.2d 1271 (Ill. App. Ct. 1998); Asplundh Tree Experts, Inc. v. Mason, 693 So.2d 44 (Fla. Ct. App. 1997); Ford v. Shallowater Airport, 492 S.W.2d 655 (Tex. Civ. App. 1973).

¹⁴⁹ A. Bryan Endres, "GMO: Genetically Modified Organism or Gigantic Monetary Obligation? The Liability Schemes for GMO Damage in the United States and the European Union", 22 LOY. L.A. INT'L & COMP. L. REV. 453, 482-488 (2000).

¹⁵⁰ Carie-Megan Flood, *Pollen Drift and Potential Causes of Action*, 28 IOWA J. CORP. L. 473, 487-93 (2003).

¹⁵¹ Richard A. Repp, *Biotech Pollution: Assessing Liability for Genetically Modified Crop Production and Genetic Drift*, 36 IDAHO L. REV. 585, 616-20 (2000).

¹⁵² Franken v. Sioux Center, 272 N.W.2d 422, 424 (Iowa 1978) (owner of tiger strictly liable for harm caused by it).

¹⁵³ Exner v. Sherman Power Const. Co., 54 F.2d 510 (2d Cir. 1931) (strict liability imposed on company that stored dynamite).

¹⁵⁴ Bella v. Aurora Air, Inc., 566 P.2d 489, 495 (Ore. 1977) (defendant was strictly liable for spraying of 2,4-D due to it being an abnormally dangerous activity).

¹⁵⁵ Richard A. Repp, *Biotech Pollution: Assessing Liability for Genetically Modified Crop Production and Genetic Drift*, 36 IDAHO L. REV. 585, 617-18 (2000); A. Bryan Endres, "GMO: Genetically Modified Organism or Gigantic Monetary Obligation? The Liability Schemes for GMO Damage in the United States and the European Union", 22 LOY. L.A. INT'L & COMP. L. REV. 453, 488-91 (2000); David Moeller, *GMO Liability Threats for Farmers, Legal Issues Surround the Planting of Genetically Modified Crops*, Institute for Agriculture and Trade Policy (Nov. 2001), available at <http://www.flaginc.org/pubs/arts/GMOthreats.pdf>.

¹⁵⁶ 567 P.2d 218 (Wash. 1977).

¹⁵⁷ John P. Mandler & Kristin R. Eads, *Liability Exposure to Seed Companies from Adventitious GMO Pollination Due to Pollen Drift Resulting in Cross Pollination or Outcrossing*, Faegre & Benson at 10 (Jan. 26, 2000), available at <http://www.faegre.com/downloads/gmo.doc>.

¹⁵⁸ Ben Lilliston, *Farmers Fight to Save Organic Crops*, THE PROGRESSIVE (Sept. 2001), available at <http://www.progressive.org/0901/lil0901.html>.

¹⁵⁹ For a good list of things farmers can do to limit GMO contamination see James Riddle, *10 Strategies to Minimize Risks of GMO Contamination*, The New Farm, available at <http://www.newfarm.org/features/0802/strategies.shtml>.

¹⁶⁰ Northern Plains Sustainable Agriculture Society, *Preventing GMO Contamination: Things You Can Do!*, available at <http://www.npsas.org/PreventGMO.html>.

¹⁶¹ Margaret Mellon & Jane Rissler, *Gone to Seed: Transgenic Contamination in the Traditional Seed Supply*, Union of Concerned Scientists (2004), available at http://www.ucsusa.org/food_and_environment/biotechnology/page.cfm?pageID=1315.

¹⁶² This information for this section is taken from the sample contract for the Bloomington, Illinois area, available at <http://oscar.dupontsg.com/OppSearch.asp> (zip code: 62563).

¹⁶³ Michael Sykuta & Joe Parcell, *Contract Structure and Design in Identity Preserved Soybean Production*, University of Missouri - Columbia Contracting and Organizations Research Institute (June 2002), available at <http://cori.missouri.edu/WPS/CORI-WPS02-01.pdf>.

¹⁶⁴ For example, a 2001 Interstate Mills identity preserved contract for high-oil content corn disclaimed all warranties and provided for a limitation of damages because the growing of corn is influenced by: “the variety selected, date of planting, occurrence of disease, insects including corn rootworm beetle, accumulated growing degree days during the growing season, contaminating pollination by non-high oil corn varieties, failure to follow the recommended method of use, and the breakdown of male sterility of the hybrid seed corn....” Interstate Mills, 2001 Agreement to Grow OPTIMUM High Oil Corn (2000), available at <http://oscar.dupontsg.com/SampleContract.asp?ID=OSCR00000244&CropYear=2001>.

¹⁶⁵ Karin Nowack Heimgartner, *How to Keep Organic Farming GMO-free*, FiBL DOSSIER (Feb. 2003).

¹⁶⁶ Karin Nowack Heimgartner, *How to Keep Organic Farming GMO-free*, FiBL DOSSIER at 14 (Feb. 2003).

¹⁶⁷ 2004 Vt. Acts & Resolves No. 97, An Act Related to Genetically Engineered Seed, available at <http://www.leg.state.vt.us/docs/legdoc.cfm?URL=/docs/2004/acts/ACT097.HTM>.

¹⁶⁸ James Riddle, *10 Strategies to Minimize Risks of GMO Contamination*, The New Farm, available at <http://www.newfarm.org/features/0802/strategies.shtml>.

¹⁶⁹ William Lin, *Biotechnology: U.S. Grain Handlers Look Ahead*, AGRICULTURAL OUTLOOK, AGO-270, ERS-USDA (April 2000), available at <http://www.ers.usda.gov/publications/agoutlook/apr2000/ao270h.pdf>.

¹⁷⁰ *In re Starlink Corn Prods. Liab. Litig.*, 212 F. Supp. 2d 828, 835 (N.D. Ill. 2002); Donald L. Uchtmann, *StarLink—A Case Study of Agricultural Biotechnology Regulation*, 7 DRAKE J. AGRIC. L. 159, 194 (Spring 2002).

¹⁷¹ Paul Ellias, *Biotech Revolution Costs Organic Farmers*, WASHINGTON POST (June 5, 2003). One testing company that provides a variety of services is Genetic ID. See <http://www.genetic-id.com>.

¹⁷² Marcia Ellen DeGeer, *Can Roundup Ready Seeds Ever be Corralled?: Restraining Genetic Drift Through Criminal Sanctions*, 29 N.E. J. ON CRIM. & CIV. CON. 255, 283-86 (Summer 2003).

-
- ¹⁷³ Organic Farming Research Foundation, *4th National Organic Farmers Survey: Sustaining Organic Farms in a Changing Organic Marketplace* (May 16, 2003), available at <http://www.ofrf.org/publications/survey/GMO.SurveyResults.PDF>.
- ¹⁷⁴ 7 C.F.R. §§ 205.2, 205.105(e) (2004).
- ¹⁷⁵ 7 C.F.R. §§ 205.661, 205.671 (2004); 65 Fed. Reg. 80,548, 80,628, 80,632 (2000) (prefatory comments); Agricultural Marketing Service, *The National Organic Program, Questions and Answers* (June 2003), available at <http://www.ams.usda.gov/nop/Q&A.html>.
- ¹⁷⁶ 7 C.F.R. § 205.201(a)(5) (2004).
- ¹⁷⁷ Kent Thiesse, *Be Cautious About Signing GMO-Free Documents*, THE CORN AND SOYBEAN DIGEST (Jan. 2, 2002), available at http://soybeandigest.com/ar/soybean_cautious_signing_gmofree/.
- ¹⁷⁸ Neil Harl, *Genetically Modified Crops: Guidelines for Producers*, Iowa State University (2000), available at <http://www.extension.iastate.edu/Pages/grain/publications/buspub/0010harl1.pdf>.
- ¹⁷⁹ Paul Geitner, *EU Fails to Lift Biotech Crop Ban: Application Now Heads to EU ministers*, AGWEEK (Dec. 15, 2003).
- ¹⁸⁰ Andrew Burchett, *Biotech Divide Widens: Market and Location Dictate Which Way Technology Flows*, FARM JOURNAL (Oct. 2003); Pioneer Hi-Bred International, Inc., *Biotechnology - Grain Import Status of Biotech Grain* (July 2003), available at http://www.pioneer.com/biotech/import_approval_status/import_status.htm.
- ¹⁸¹ Press Release, European Commission, *GMOs: Commission Authorises Import of GM-maize for Use in Animal Feed* (July 19, 2004), available at <http://europa.eu.int/rapid/pressReleasesAction.do?reference=IP/04/957&format=HTML&aged=0&language=EN&guiLanguage=en>.
- ¹⁸² Press Release, Council of the European Union, No. 11234/1/04 REV 1, *Agriculture and Fisheries at 10* (July 19, 2004), available at http://ue.eu.int/ueDocs/cms_Data/docs/pressData/en/agricult/81505.pdf.
- ¹⁸³ Margaret Rosso Grossman & A. Bryan Endres, *Regulation of Genetically Modified Organisms in the European Union*, 44 AMERICAN BEHAVIORAL SCIENTIST 378, 423 (2000).
- ¹⁸⁴ Press Release, United States Trade Representative, *U.S. and Cooperating Countries File WTO Case Against EU Moratorium on Biotech Foods and Crops: EU's Illegal, Non-Science Based Moratorium Harmful to Agriculture and the Developing World* (May 13, 2003), available at http://www.ustr.gov/Document_Library/Press_Releases/2003/May/U.S._Cooperating_Countries_File_WTO_Case_Against_EU_Moratorium_on_Biotech_Foods_Crops.html.
- ¹⁸⁵ Michael Howe, *European activists would welcome WTO challenge over moratorium*, FEEDSTUFFS (Jan. 6, 2003).
- ¹⁸⁶ Switzerland, Federal law Relating to Non-human Gene Technology, 1999-6136 (March 21, 2003), available at <http://www.umwelt-schweiz.ch/imperia/md/content/stobobio/biotech/17.pdf>.
- ¹⁸⁷ Kristin Dawkins, *Behind US Challenge of Europe on GMOs*, Organic Consumers Ass'n (June 9, 2003), available at http://www.organicconsumers.org/ge/gmo_wto.cfm.
- ¹⁸⁸ Cartagena Protocol on Biosafety, *About the Protocol* (Feb. 4, 2004), available at <http://www.biodiv.org/biosafety/background.asp>.
- ¹⁸⁹ Press Release, Institute for Agricultural and Trade Policy, *IATP Applauds International Ratification of UN Biosafety Treaty* (June 16, 2003) at

http://www.iatp.org/iatp/library/admin/uploadedfiles/IATP_Applauds_International_Ratification_of_UN.htm

¹⁹⁰ Commission for Environmental Cooperation of North America, *Maize and Biodiversity, The Effects of Transgenic Maize in Mexico*, 8 November 2004 available at http://www.cec.org/files/PDF/Maize-and-Biodiversity_en.pdf).

¹⁹¹ David R. Purnell, *International Implications of New Agricultural Biotechnology*, 25 U. MEM. L. REV. 1189 (Spring 1995).

¹⁹² Reuters, *Brazil GMO Soy Law Faces New Legal Challenge*, Agriculture Online (Jan. 14, 2004), available at http://www.agriculture.com/worldwide/IDS/2004-01-14T210849Z_01_N14377648_RTRIDST_0_BRAZIL-GM-SOY.html.

¹⁹³ Reese Ewing, *Brazil Soy Trade to Pay Monsanto Royalties*, Reuters (Jan. 28, 2004), available at <http://www.forbes.com/markets/newswire/2004/01/28/rtr1232247.html>.

¹⁹⁴ Erin Galbally, *Minnesota Soybean Farmers Remain Frustrated with Brazil*, Minnesota Public Radio (Nov. 11, 2003), available at http://news.mpr.org/features/2003/11/10_galballye_soybeans/.

¹⁹⁵ General Accounting Office, *Biotechnology: Information on Prices of Genetically Modified Seed in the United States and Argentina*, GAO-00-55 (Jan. 2000), available at <http://www.gao.gov/archive/2000/r400055.pdf>; General Accounting Office, *Statement of Robert E. Robertson, Associate Director Food and Agriculture Issues, Resources, Community, and Economic Development Division, Biotechnology: Information on Prices of Genetically Modified Seed in the United States and Argentina*, GAO-00-228 (June 29, 2000), available at <http://www.gao.gov/archive/2000/r400228t.pdf>.

¹⁹⁶ Mike Holmberg, *Cheaper Roundup Ready Seed Gives Argentina an Advantage*, SUCCESSFUL FARMING (April 2000), available at <http://www.agriculture.com/sfonline/sf/2000/april/0006bcol.html>; Press Release, American Soybean Growers, *ASA Calls for Equitable Sales Practices for Soybean Seedstock* (Feb. 22, 2000), available at <http://www.soygrowers.com/newsroom/releases/documents/gaopricing.htm>.

¹⁹⁷ Anne E. Crocker, *Will Plants Finally Grow Into Full Patent Protection on an International Level? A Look at the History of U.S. and International Patent Law Regarding Patent Protection for Plants and the Likely Changes After the U.S. Supreme Court's Decision in J.E.M. Ag Supply v. Pioneer Hi-Bred*, 8 DRAKE J. AGRIC. L. 251 (Summer 2003).

¹⁹⁸ Hilary Burke, *Argentina OKs Monsanto's Roundup Ready GMO Corn*, REUTERS (July 14, 2004).

¹⁹⁹ Jerry W. Kram, *Agriculture: Biotech Boon for North Dakota?*, GRAND FORKS HERALD (June 25, 2002), available at <http://www.grandforks.com/mld/grandforks/3538042.htm>; National Center for Food and Agricultural Policy, *Plant Biotechnology: Current and Potential Impact For Improving Pest Management In U.S. Agriculture An Analysis of 40 Case Studies* (June 2002), available at <http://www.ncfap.org/40CaseStudies/MainReport.pdf>; Council for Biotechnology Information, *Economic Benefits of Biotech Crops* (2003), available at <http://www.whybiotech.com/index.asp?id=1822>.

²⁰⁰ Charles M. Benbrook, *Impacts of Genetically Engineered Crops on Pesticide Use in the United States: The First Eight Years*, BioTech InfoNet (Nov. 2003), available at http://www.biotech-info.net/Technical_Paper_6.pdf. See also, Charles M. Benbrook, *When Does It Pay To Plant Bt Corn? Farm-Level Economic Impacts of Bt Corn, 1996-2001*, BioTech InfoNet (Nov. 2001), available at http://www.biotech-info.net/Bt_corn_FF_final.pdf; Charles M. Benbrook, *Premium Paid for Bt Corn Seed Improves Corporate Finances While Eroding Grower Profits*, BioTech InfoNet (Feb. 2002), available at http://www.biotech-info.net/Distribution_benefits.pdf.

²⁰¹ Charles M. Benbrook, *Impacts of Genetically Engineered Crops on Pesticide Use in the United States: The First Eight Years*, BioTech InfoNet at 4 (Nov. 2003), available at http://www.biotech-info.net/Technical_Paper_6.pdf.

²⁰² Charles M. Benbrook, *Impacts of Genetically Engineered Crops on Pesticide Use in the United States: The First Eight Years*, BioTech InfoNet at 4 (Nov. 2003), available at http://www.biotech-info.net/Technical_Paper_6.pdf.

²⁰³ See University of Missouri, *Glyphosate-resistant Mare's Tail 'Erupting'*, Agriculture Online (Aug. 9, 2004) (describing new research from University of Missouri weed scientists that shows mare's tail is becoming resistant to glyphosate-based herbicides, including Roundup).

²⁰⁴ Del Deterling, *Roundup Ready Still Demands Management: As good as the herbicide-resistant varieties are, sometimes they need a little help*, PROGRESSIVE FARMER (Aug. 2002), available at <http://www.progressivefarmer.com/farmer/magazine/article/0,14730,322503,00.html>.

²⁰⁵ Syl Marking, *The Soybean Aphid Blitz*, CORN AND SOYBEAN DIGEST (Feb. 1, 2002), available at http://soybeandigest.com/ar/soybean_soybean_aphid_blitz_2/.

²⁰⁶ Dan Sullivan, *Is Monsanto's Patented Roundup Ready Gene Responsible for a Flattening of U.S. Soybean Yields That Has Cost Farmers an Estimated \$1.28 Billion?: Presentation at 2004 Midwest Soybean Conference Explores the Numbers...and the Potential Causes Behind Them*, THE NEW FARM (Sept. 28, 2004), available at <http://newfarm.org/features/0904/soybeans>.