

# Governor's Task Force on Genetically Engineered Seeds and Agricultural Products

Task Force Report



# Introduction, Purpose, and Summary

## Introduction and Purpose

Genetically modified organisms (GMOs) and regulation of genetically engineered (GE) seeds and food products have received increased attention in several US states, including Oregon and its neighbors Washington and California. The recent passage of SB 863<sup>1</sup> in 2013 by Oregon's legislature preempted local regulation of GE seeds. Ballot initiative 15-119<sup>2</sup> to ban the growth of GE crops in Jackson County was identified as the only exception.

Dialogue related to GE issues has often been polarizing due to the passion that different actors bring to this topic and the broad range of often-conflicting perspectives. Recognizing this challenge, the governor sought to bring representatives of diverse interests together to help frame the issues so that legislators would have an opportunity to consider the issues in a way that reflects the full range of perspectives. To meet this need, the Governor's Natural Resources Office (GNRO) for the State of Oregon requested that the Oregon Consensus program serve as a neutral forum to convene and facilitate a task force with members representing diverse perspectives in order to frame Oregon's GE-related issues in the form of a public briefing document for Oregon's governor and state legislators in advance of the 2015 legislative session.

At its kickoff meeting in April of 2014 the governor charged the Task Force with three objectives:

1. Identify and frame the main challenges between growers of GE crops and other agricultural producers in Oregon;
2. Identify and describe areas of agreement and disagreement related to GE and non-GE food products, including and especially related to information for consumers; and
3. Identify and describe what other jurisdictions have done, or have proposed doing, to address these areas of concern.

This report captures the results of the task force's work from April through November 2014. Over the course of seven months, task force members engaged in a dialogue about a wide variety of GE related topics. The following list provides an overview of the topics covered during the task force discussions. The list of topics reflects task force member's suggestions on the full suite of topics associated with GE agriculture in Oregon. A summary of task force member reflections on each of these topics is included in the second half of the report. The first eight pages of the report serve as an executive summary. These pages are a distillation of many of the topics discussed by the task force and include a summary of key themes that emerged from task force member conversations as well as a summary of areas of alignment and disagreement among task force members. *Task force members had considerable expertise on GE topics; this report explains the task force members' perspectives on key GE-related topics, but it does not attempt to describe the state of the science or scientific consensus on items discussed in the report.*

This report is intended to distill the perspectives captured during these thoughtful and important conversations. While it is not a broad assessment of every possible perspective on GE or GMOs, the report is informed by public comment submissions that were considered by the task force and by input provided during the public review process.

<sup>1</sup> Oregon Senate Bill 863. (2013). <https://olis.leg.state.or.us/liz/2013S1/Measures/Overview/SB863>

<sup>2</sup> Jackson County Genetically Modified Organism Ban, Measure 15-119. (2013). [http://ballotpedia.org/Jackson\\_County\\_Genetically\\_Modified\\_Organism\\_Ban,\\_Measure\\_15-119\\_\(May\\_2014\)](http://ballotpedia.org/Jackson_County_Genetically_Modified_Organism_Ban,_Measure_15-119_(May_2014))

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Appointed Task Force Members	Task Force Topics
<p><b>Convener:</b> Jennifer Allen, Director, Institute for Sustainable Solutions, Portland State University</p> <p><b>Convener:</b> Dan Arp, Dean, College of Agricultural Sciences, Oregon State University</p> <p>Barry Bushue, Oregon Farm Bureau</p> <p>Katy Coba, Oregon Department of Agriculture (<i>ex-officio</i>)</p> <p>Connie Kirby, Northwest Food Processors Association</p> <p>Greg Loberg, Oregon Seed Association</p> <p>Ivan Maluski, Friends of Family Farmers</p> <p>Frank Morton, Shoulder to Shoulder Farm</p> <p>Jim Myers, Oregon State University</p> <p>Marty Myers, Threemile Canyon Farms</p> <p>Paulette Pyle, Oregonians for Food and Shelter</p> <p>Chris Schreiner, Oregon Tilth</p> <p>Lisa Sedlar, Green Zebra Grocery</p> <p>Steven H. Strauss, Oregon State University</p> <p>Sam Tannahill, A to Z Wineworks</p>	<p><i>Coexistence</i></p> <ul style="list-style-type: none"> <li>• Cross-pollination and Gene Flow</li> <li>• Practices               <ul style="list-style-type: none"> <li>○ Mapping and Pinning</li> <li>○ Control Areas</li> </ul> </li> <li>• Voluntary vs Mandatory Approaches</li> <li>• Legal Liability, Compensation, Enforcement</li> </ul> <p><i>Consumer and Grower Information/Choice</i></p> <ul style="list-style-type: none"> <li>• Food Safety</li> <li>• Consumer Information, Education and Public Perception</li> <li>• Promotion</li> <li>• Certification</li> <li>• Labeling</li> </ul> <p><i>Economic and Social Impacts</i></p> <ul style="list-style-type: none"> <li>• Food Supply and Climate Adaptation</li> <li>• Market and Tolerance</li> <li>• Ethics and Values</li> <li>• Licensing, Seed Ownership, and Intellectual Property</li> <li>• Trade and Tariffs</li> <li>• Occupational Safety</li> </ul> <p><i>Environmental Impacts</i></p> <ul style="list-style-type: none"> <li>• Biodiversity</li> <li>• Chemical load</li> <li>• Crop Yields and Land Utilization</li> <li>• Gene Flow</li> <li>• Pest Management</li> <li>• Soil Impacts</li> <li>• Water Quality</li> </ul> <p><i>Existing Legal and Policy Issues</i></p> <ul style="list-style-type: none"> <li>• Oregon Authorities and Statutes</li> <li>• Federal Authorities and Statutes</li> <li>• Potential Conflicts Between State and Federal Authorities</li> <li>• Legal Topics</li> <li>• Other Policy Topics</li> </ul>
Facilitation Team	
<p>Peter Harkema, Oregon Consensus</p> <p>Jessie Conover, Oregon Consensus</p>	

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## Key Policy Considerations

Reflecting on the challenges between growers, processors, the areas of agreement and disagreement among task force members, and the information the task force received from state and federal agencies regarding their authorities and activities, the task force identified a number of key policy considerations that would benefit from further exploration. The following is not intended to be a comprehensive list of all the policy issues that need to be addressed, rather it is a summary of key issues that, if further explored, would clarify and improve the state of Oregon's approach to GE agriculture issues.

- Clarify the interaction between state and federal law for Oregon stakeholders.
- Clarify the role the state could play in regulating GE crops under its existing and potential authorities.
- Facilitate communication and education among people on all sides of this issue, at multiple levels - farmer, processor, consumer, and policy.
- Clarify the nature of a labeling system, cognizant of the current ballot measure on GE labeling (Measure 92<sup>3</sup>).
- Find a path to coexistence that sustains and protects all Oregon markets, including organic, conventional, and GE.
- Fill Oregon-specific data gaps related to GE crops.

## Overarching Themes and Areas of Alignment and Disagreement

During the course of its work, the task force thoroughly examined each topic related to GE issues in Oregon. The details of those conversations are captured in the topic descriptions in this report. A number of overarching themes emerged during the task force's exploration of topic areas. As part of this, cross cutting areas of alignment and areas of disagreement among perspectives of the task force emerged and are articulated below. These descriptions help to paint the picture of the GE landscape in Oregon and may serve decision makers as they seek to understand where opportunities and gaps exist.

### Overarching Themes (*in no particular order*)

- *Oregon agriculture is unique in a number of ways.* Relative to major commodity-focused states, Oregon grows fewer GE crops and has a robust specialty seed and food presence in both the conventional and organic sectors. GE crops are grown in Oregon, but not to the extent that GE corn dominates in the Corn Belt, for example. On the other hand, Oregon's global connections impact its economy and industries such as Oregon food processing are not unique.
- *Many GE issues are not exclusive to GE crops.* Task force members frequently found that many of the topics discussed in the broader GE debate and that are included below are not uniquely GE topics. For example, cross-contamination (often referred to in the public arena as "cross-pollination") is a primary issue that arises in conflicts between GE and non-GE growers, but it is also a longstanding issue in the Oregon seed industry.
- *More data are needed, especially for GE use in Oregon.* Nearly all task force members agreed that additional data and research on GE crops would be valuable to better understand the topics in this report. Of particular detriment to the examination of these issues for Oregon is a lack

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<sup>3</sup> Oregon Ballot Measure 92 (2014)

[http://ballotpedia.org/Oregon\\_Mandatory\\_Labeling\\_of\\_GMOs\\_Initiative,\\_Measure\\_92\\_\(2014\)](http://ballotpedia.org/Oregon_Mandatory_Labeling_of_GMOs_Initiative,_Measure_92_(2014))

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of information regarding GE use in Oregon agriculture. On a broader level, there are varying degrees of confidence in the existing data on GE crops. There is also a lack of data on the extent of financial damage incurred by non-GE growers due to organic and international market intolerance for crops with inadvertent GE presence and a disincentive for non-GE growers to report this information for fear of losing markets. Others felt there was sufficient data on processed products and labeling related issues and some noted that a lack of information is not unique to GE agriculture

- *Regulatory sufficiency.* In the regulatory realm, some task force members are confident that USDA deregulation of GE crops, in addition to EPA permitting of GE related pesticides and FDA assessment of foods provide strong evidence to support GE crop safety. Others expressed concern about the duration and independence of studies, the level of ongoing monitoring by regulators, and coordination among agencies.
- *The issues are polarizing and common ground is hard to find.* Task force members agreed that the language surrounding the broader GE debate is complicated and often confused by terminology. Terms like GE, GMO, biotechnology, bioengineering etc. are often used interchangeably. As a result the public often struggles to understand the various perspectives related to this complex topic. The task force recognized that a similar dynamic exists with terminology like sustainable, natural, GMO-free, non-GMO, etc. Task force members agreed that in the broader debate about GE crops, hyperbole is often used and unsubstantiated claims are made. The result of this dynamic is that fringe issues often dominate the public discourse on GE-related topics and issues are framed as irreconcilable conflicts when in fact common ground may exist. All members agreed that clearly differentiating peripheral issues and claims from more pressing and substantive issues would do much to improve the potential to move forward with strong public policy about GE. The task force has made an effort in this report to describe what it sees as the central GE issues that need to be addressed in the state of Oregon. They generally agree that public education about GE, and the food system in general, is limited and that more is needed.
- *There are diverse opinions about the best approaches to achieve coexistence between growers.* While task force members agree that there should be a way to resolve issues of coexistence between growers, they do not agree on how to approach the issue. Some believe that coexistence should be worked out on a voluntary, farmer-to-farmer level, while others see a role for regulation at the state or federal level. They agree that there are currently no uniform national or Oregon coexistence regulations for growers.
- *Allocation of risk and balancing risk with benefits is an important consideration in many GE related policies.* Task force members described a number of ways in which the concept of “shared risk” was an important consideration. They noted, for example, that voluntary approaches to coexistence work best when all parties involved share risk. Voluntary approaches to coexistence between specialty seed crops are widespread in Oregon. Some task force members pointed to those approaches as examples for an approach to coexistence with GE agriculture. Others articulated that in the case of specialty seed growers, the risk of cross-contamination is shared between growers, while in the case of GE the risk is primarily to the non-GE grower and, in this sense, risk is not “shared” and therefore an entirely voluntary system may not be appropriate.
- *There is no consensus on issues of liability and compensation for losses.* While the task force discussed these topics, they did not coalesce around a common perspective. Liability was an important topic to task force members given the importance of allocation of risk. Some members, for example, believe that liability for GE pollen drift should rest with the companies that hold the seed license (e.g. Monsanto) while others suggested that such an arrangement would be inappropriate because it would make companies liable for actions beyond their control. Alternate constructs including self-insurance or a public insurance pool might provide

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- protection to negatively affected farmers. However, as some task force members noted, such schemes place the burden of risk either on the harmed farmer or on the public.
- *ODA is not currently regulating most GE crops or implementing Oregon-specific policies.* During the task force's work, members heard a number of reports from ODA regarding their authority and activities on GE agriculture. It was clear that ODA does not take additional steps to regulate GE crops after the federal government deregulates them, with the exception of biopharmaceuticals. Opinions varied regarding whether ODA could take additional steps to regulate GEs under its current authority. Task force members discussed additional potential roles that ODA might take, and opinions differed about the appropriate role of the state in regulating GE crops. However, all task force members agreed that additional state authorities would incur fiscal impacts and require additional resources.
  - *Rights have a prominent role in the GE conversation.* The task force identified two areas where perceived rights come into conflict on GE issues in Oregon. First, the perceived right of some consumers to information about the products they consume comes into conflict with the businesses' perceived right to disclose certain GE information voluntarily. Second, a farmer's perceived right to grow what and how they choose may conflict with another farmer's perceived right not to experience gene flow onto their property, or vice versa. Perspectives on all sides of these rights issues were represented on the task force.
  - *Many of the perspectives on these issues are rooted in values.* While there are many technical aspects of the discussion surrounding GE, in many ways the subject is values-based. Differences in values are seldom resolved by scientific research alone. In the task force's conversations, the values of privacy, neighborliness, individualism, interventionism, sustainability, safety, and the free market played a critical role in informing task force member perspectives. Often, different underlying values led to different perspectives and positions on the issues, as demonstrated in this report.
  - *The farming community has a role to play in mitigating risk.* Task force members noted that daily farming practices and communication among growers should play a significant role in mitigating the risk of contamination, although they also acknowledging that coexistence among farmers has not always been without conflict. Additionally, the agricultural community has an important role to play in shaping the state's approach to GE, whether it is voluntary or mandatory.
  - *Grower reputation is at the core of many coexistence issues.* All of Oregon's agricultural sectors depend on a personal reputation to successfully sell their products and maintain their stature in the marketplace. Markets for various agricultural sectors differ in their expectations, so the impact of a cross-contamination event in a diverse grower environment is different for each sector.

### **Areas of Alignment** (*in no particular order*)

The task force was not charged with reaching consensus on key GE issues facing the state of Oregon. Nevertheless, over the course of its discussions a number of key areas in which task force members share broad alignment began to emerge. The following section provides brief descriptions of the areas where alignment was clear among task force members.

- *Communication:* Communication was a recurring area of discussion among the task force members. They noted that better communication is needed at all levels of the GE discussion, among farmers, breeding experts, and policy experts, and from growers and processors to consumers (and vice versa). Task force members described much of the historic rhetoric (at all levels) surrounding GE issues as polarizing and inflammatory. Often, they noted, discussion has focused on "fringe" claims from both sides rather than on key issues such as those undertaken by this task force - both technical and policy. At the policy level, members expressed a desire to have a forum to continue discussions about these topics

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in a productive manner that facilitates better understanding among all actors. There was recognition among the members that full agreement on all issues may not be possible but that direct communication holds value for exploring these complex topics. Improved communication and clear direction at the policy level hold potential to ameliorate challenging neighbor-to-neighbor issues since they often arise from a lack of policy certainty or conflicting interpretations of existing policies. While there are varying perspectives about how best to address many issues, task force members agreed that Oregon's agricultural community is best served when neighbors are working cooperatively and are not pitted against one another.

- *Data gaps:* Task force members consistently agreed that there is a shortage of data on GE crops in Oregon. The lack of data on GE in Oregon impedes the ability of the task force to answer key questions regarding GE in the state. For example, there are no quantitative data about total acreage or location of GE crops in Oregon. This is due in part to concerns about the release of confidential business information, the capacity to collect such information on a statewide scale, and because current agricultural data gathering programs like USDA Census of Agriculture do not currently ask producers for this type of information.
- *GE Technology:* Task force members acknowledged that GE technology holds potential to continue to be applied in a broad array of agricultural settings. However, at present the vast majority of GE crops in commercial use are used to facilitate pest management (either herbicide tolerance or pest resistance).
- *Governance:* Task force members had considerable discussion about the appropriate governance structure to manage the complex topics surrounding GE crops and processed products in the state. There was some agreement among the task force members that clarity surrounding governance of GE crops, whether voluntary, mandatory, or a combination, would be beneficial in providing predictability and certainty for producers and processors. There was disagreement among members as to the appropriate role of state versus federal agencies and of voluntary and mandatory mechanisms. Task force members noted that new roles taken on by the state would have a potential fiscal impact.
- *Gene Flow:* Task force members agreed that there are concerns about gene flow from GE plants into other crops and the environment (e.g. to weeds of similar species), and the associated market impacts resulting from cross-contamination or drift. Given the task force's charge, cross-pollination issues associated with GE crops that are pollinated openly (e.g. wind and insects) were of particular concern; however, many noted that cross-contamination issues are not unique to GE crops. Moreover, cross-contamination from organic or conventional crops to GE crops (i.e. sugar beet seed) can be of significant concern to certain growers. For these reasons, the area of cross-contamination was an area that many on the task force felt may be ripe for policy guidance or additional clarity.
- *Adaptability:* Task force members acknowledge that the science, technology, and policy surrounding GE are changing rapidly. Given this, they agreed that any approaches taken to address GE issues in the state of Oregon should be adaptable and nimble enough to respond to a shifting landscape.

### **Areas of Disagreement** (*in no particular order*)

In addition to identifying areas of alignment over the course of its discussions, task force members articulated a few areas of disagreement among their perspectives. This section provides brief descriptions of the areas where there was disagreement among task force members.

- *Governance:* The task force's work was focused on GE issues in the state of Oregon as it is situated in a broader regulatory, market, and agricultural context. As such, ODA's authority was the topic of considerable conversation among the members. There were varied and strong perspectives among members on whether ODA should or could take on a larger role

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- at present or if its authorities were changed. There is disagreement about what the best approach to governance at the state level should be.
- *Federal vs. State Authority:* There is disagreement about whether the federal regulatory framework sufficiently protects growers, processors, and consumers, specifically whether the potential environmental and human health impacts of GE, both on the individual and ecosystem levels, undergo sufficient review by a non-biased source. Some are very confident in the regulatory framework and trust that the review processes produce sound results. Others perceive gaps and disconnect among agencies in the framework and a lack of independent review, and see a role for the state to be proactive in filling the gaps.
  - *Labeling:* Task force members vary in their perception of how GMO labeling affects 1) consumer understanding and choice and 2) food costs and availability. While some perceive an increase in consumer choice facilitated by more label information, others perceive a net decrease in consumer choice if labeling requirements lead to manufacturers pulling products off shelves. The question of how food costs and availability would or would not be affected by labeling was not greatly discussed by the task force.
  - *Science:* The value of GE agriculture and extent to which current science and research support or challenge GE remains an area of disagreement among task force members. Some are confident that the existing science is sufficient to support GE's potential and equivalence to non-GE products. Others have less confidence in the scientific support of GE technology, either because they see the claims of GE potential as overstated, or because they do not think that scientific study around GE is robust, independently verified, or sufficiently long-term. Limitations on research due to patent restrictions are of particular concern to some task force members. Further disagreements arose around decision-making and scientific information, with some pushing to continue research but to also move forward given the current information on the safety and environmental impacts of GE, and others calling for a pause on the spread of GE so more study can be done on potential environmental and human health impacts.
    - *Science/Policy Interface:* It is important to note that it is inherently challenging to resolve scientific disputes in a conversation among stakeholders about policy. Simultaneously, science is one among many important considerations in policy decision-making.
  - *Environmental and human health impacts:* Task force members expressed a range of views on the potential environmental and human health impacts of GE. One aspect of this debate centered on risk, where some task force members are satisfied with a finding of substantial equivalence, others seek a different risk threshold and prefer to use the precautionary principle. (Substantial equivalence is the safety assessment standard used by the federal agencies that regulate GE in the US, among others. The precautionary principle is an approach to risk management which recommends that, when an activity raises the risk of harm to the environment or human health, precautionary measures should be taken even when some cause and effect relationships are not fully established scientifically. In this context the proponent of an activity, rather than the public, should bear the burden of proof.)



## Examples from Other Jurisdictions

As Oregon explores a path forward, it can be helpful to learn from the experiences of other places that have grappled with this issue. Below are descriptions of policies, efforts, and ideas from within Oregon, in other US states, and around the world, from legislative solutions to grassroots approaches.

There are several approaches to GEs ranging from little state involvement to labels on foods to voluntary coexistence efforts to outright bans. At the time that Oregon's task force was working on these issues, there were as many as 35 labeling initiatives in 20 US states. Worldwide, 64 countries have mandatory GE food labeling standards though these standards are not harmonized across jurisdictions and are enforced and implemented in varied ways. Influential and nearby approaches are reviewed below.

### *GE coexistence efforts in other states*

- In Illinois, the Agricultural Production Contract Code<sup>4</sup> requires that agricultural production contracts address adventitious presence issues if the crop will be held to a threshold standard.
- Maine has adopted best management practices (BMPs) in rule<sup>5</sup> to promote coexistence of GE crops with conventional and organic crops.
- The University of Minnesota Southwest Research and Outreach Center published a guide to coexistence for Minnesota farmers. The guide includes best management practices and resources for GE and non-GE producers.
- Missouri has established grower districts—with cooperation by farmers—for biopharmaceutical crops.<sup>6</sup>
- A three-year consensus-building effort in North Dakota resulted in the development of some agreed-upon best management practices (BMPs), though the effort ultimately stopped due to some participants leaving the process.<sup>7</sup>

### *GE coexistence efforts around the world*

- The European Commission has adopted a guidance document<sup>8</sup> with rules for peaceful coexistence, in addition to devoting research to cross-contamination studies. Some member states, including Ireland, have adapted the guidance to local conditions. Ireland's policy allows farmers to sue for economic and reputation losses resulting from cross-contamination by GE material (above threshold limits) and also establishes a fund and an arbitration board to settle disputes. Eventually marketers and users of GE technology will be responsible for compensating losses. Both mandatory and voluntary practices are outlined in the guidance document.<sup>9,10</sup>

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<sup>4</sup> Illinois Agricultural Production Contract Code (505 ILCS 17/).

<http://www.ilga.gov/legislation/ilcs/ilcs3.asp?ActID=2485&ChapterID=40>

<sup>5</sup> Maine Agency Rule 01-001 CMR Chapter 9. <http://www.maine.gov/sos/cec/rules/01/chaps01.htm#001>

<sup>6</sup> Peaceful Coexistence among Growers of: Genetically Engineered, Conventional, and Organic Crops. (2006). [http://sbc.ucdavis.edu/old\\_files/29322.pdf](http://sbc.ucdavis.edu/old_files/29322.pdf). See pages 34-38.

<sup>7</sup> *Ibid.* See pages 38-42.

<sup>8</sup> Coexistence of genetically modified crops with conventional and organic agriculture.

[http://ec.europa.eu/agriculture/gmo/coexistence/index\\_en.htm](http://ec.europa.eu/agriculture/gmo/coexistence/index_en.htm)

<sup>9</sup> Peaceful Coexistence among Growers of: Genetically Engineered, Conventional, and Organic Crops. (2006). [http://sbc.ucdavis.edu/old\\_files/29322.pdf](http://sbc.ucdavis.edu/old_files/29322.pdf). See pages 18-21.

<sup>10</sup> Coexistence of GM and non-GM Crops in Ireland [http://www.agriculture.gov.ie/gm\\_coexistence/](http://www.agriculture.gov.ie/gm_coexistence/)

- New Zealand has a robust coexistence system for organic and conventional crops that could be adapted to GE, though GE crops are not currently grown in New Zealand.<sup>11</sup>

### *Germane labeling efforts in US states*

- California Proposition 37<sup>12</sup> (2012) would have required labeling of GE foods and precluded the word ‘natural’ from being used on foods containing GE ingredients. The initiative failed 51.41% to 48.59%.
- Washington Initiative 522<sup>13</sup> (2013) would have required labeling of GE foods. It was forwarded to the state legislature. When they did not vote on it, it moved to the 2013 general election ballot. The measure failed 51.09% to 48.91%.
- In 2014, Vermont passed HB 112<sup>14</sup>, which requires labeling of GE foods sold in Vermont. This legislation has been challenged in court.
- In 2013, Connecticut<sup>15</sup> and Maine<sup>16</sup> passed GE labeling bills that will only go into effect if other New England states pass similar laws.
- In 2005, Alaska<sup>17</sup> passed mandatory labeling for GE shellfish and fish, though no GE fish have yet been approved by the FDA.

### *Bans and restrictions on growing GE crops*

- Jackson County<sup>18</sup> and Josephine County<sup>19</sup> in Oregon voted in 2014 to ban production of GE foods in their counties, though Josephine County’s ban is preempted by state action. Burlington, Vermont and Boulder, Colorado have moratoria on GE food and growing of GE crops, respectively.
- Oregon’s existing control area for GE bentgrass bans it from the Willamette Valley and restricts its growth in Jefferson County.<sup>20</sup>
- In 2013 the Big Island of Hawaii passed Bill 113 prohibiting the growth of new GE crops (with the exception of papaya) and prohibiting biotech companies from operating on the island. In 2013 Kauai County, Hawaii, passed Ordinance 960<sup>21</sup> requiring large farms and companies to disclose pesticide use, create pesticide buffer zones, and disclose where they grow GE crops. A federal judge ruled that the Kauai County ordinance is preempted by state law, but that requiring disclosure of GE crop locations is not preempted by federal law<sup>22</sup> and legal challenges to this law continue.

<sup>11</sup> GM & Coexistence. New Zealand Ministry for Primary Industries.

<http://www.mpi.govt.nz/agriculture/rural-communities/gm-coexistence>

<sup>12</sup> California Proposition 37 (2012).

[http://ballotpedia.org/California\\_Proposition\\_37,\\_Mandatory\\_Labeling\\_of\\_Genetically\\_Engineered\\_Food\\_\(2012\)](http://ballotpedia.org/California_Proposition_37,_Mandatory_Labeling_of_Genetically_Engineered_Food_(2012))

<sup>13</sup> Washington Initiative 522 (2013).

[http://ballotpedia.org/Washington\\_Mandatory\\_Labeling\\_of\\_Genetically\\_Engineered\\_Food\\_Measure,\\_Initiative\\_522\\_\(2013\)](http://ballotpedia.org/Washington_Mandatory_Labeling_of_Genetically_Engineered_Food_Measure,_Initiative_522_(2013))

<sup>14</sup> Vermont HB 112 (2014). <http://www.leg.state.vt.us/database/status/summary.cfm?Bill=H.0112>

<sup>15</sup> Connecticut Public Act No. 13-183. <http://www.cga.ct.gov/2013/act/pa/pdf/2013PA-00183-R00HB-06527-PA.pdf>

<sup>16</sup> Maine LD 718. [http://www.mainelegislature.org/legis/bills/bills\\_126th/billtexts/HP049001.asp](http://www.mainelegislature.org/legis/bills/bills_126th/billtexts/HP049001.asp)

<sup>17</sup> Alaska SB 25 (2005-2006). [http://www.legis.state.ak.us/basis/get\\_bill\\_text.asp?hsid=SB0025Z&session=24](http://www.legis.state.ak.us/basis/get_bill_text.asp?hsid=SB0025Z&session=24)

<sup>18</sup> Jackson County Measure 15-119 (2014).

[http://ballotpedia.org/Jackson\\_County\\_Genetically\\_Modified\\_Organism\\_Ban,\\_Measure\\_15-119\\_\(May\\_2014\)](http://ballotpedia.org/Jackson_County_Genetically_Modified_Organism_Ban,_Measure_15-119_(May_2014))

<sup>19</sup> Josephine County Measure 17-58 (2014). <http://www.co.josephine.or.us/files/17-58ballotitlewebsite.pdf>

<sup>20</sup> ODA Quarantines and Control Area Orders

<http://www.oregon.gov/ODA/programs/NurseryChristmasTree/Pages/Quarantines.aspx>

<sup>21</sup> Kauai County Ordinance 960 <http://qcode.us/codes/kauaicounty/revisions/960.pdf>

<sup>22</sup> Syngenta Seeds, Inc. v. Cnty. of Kauai, No. 14-00014 (D. Haw. Aug. 25, 2014)

- Three counties in California have banned GE crops (Mendocino, Trinity, and Marin), though no GE crops were grown in these areas prior to the ban.
- In Sept 2014, CA passed Assembly Bill No. 504 that bans GE fish production in all state waters.<sup>23</sup>
- In the autumn of 2012, San Juan County, Washington passed Proposition 2012-4, which bans the growth of genetically modified organisms within the county.<sup>24</sup>
- *Outside the United States:* Many European countries have regional bans on GE or bans on select GE plants, such as Bt corn or plants engineered for antibiotic resistance. Some countries ban the importation of specific GE plants, such as GE wheat.

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<sup>23</sup> [http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill\\_id=201320140AB504](http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140AB504)

<sup>24</sup> <http://www.sanjuanjournal.com/news/177740361.html>

## GE Topic Descriptions

At its first five meetings, task force members examined in detail the major topics areas where perspectives around GE differ. The topic areas covered were 1) Coexistence, 2) Consumer and Grower Information and Choice, 3) Economic and Social, 4) Environmental, and 5) Existing and Potential Legal and Policy Topics. A brief summary of the perspectives for each topic area is provided below.

### Coexistence Topics

Coexistence refers to all agricultural sectors (GE, conventional, and organic) and processing functioning together. This coexistence section will examine agricultural coexistence; for processor coexistence see the ‘labeling’ subsection in the Consumer Information and Choice section below. In its discussion of coexistence, the task force identified a primary area of concern, cross-contamination, and examined several potential approaches to coexistence. The purpose of the task force’s conversations on this topic was to more clearly understand what the task force means by ‘coexistence’, further define the key issues related to coexistence, describe any approaches that other jurisdictions have taken to address these issues, and describe the unique qualities of Oregon’s agriculture sector and how they might shape each of these issues. Those themes are woven throughout the descriptions below.

### Cross-pollination & Gene Flow

Gene flow occurs when pollen, seed, or vegetative propagules from one variety of plant reaches another related type of plant and the resulting seed contains genetic material from both plants. Transfer can happen by a number of different mechanisms, including wind, insects, and accidental escape. Concerns about gene flow have existed in the agricultural arena for a long time, but are of renewed concern with genetically engineered material. Farm practices can have an impact on cross-contamination and gene flow, and any resulting contamination has implications for compensation and liability. Contamination can be problematic for the farmer whose crop is contaminated if the seed purity required by the market is compromised. Additionally, there may be market consequences if consumers do not want to purchase from a grower that has been (or might have been) contaminated.

### Practices

Task force members described a number of practices that can mitigate the risk of cross-contamination or exposure to the risk of contamination. In considering the topic of cross-contamination some task force members felt it was important to note that gene flow can be a concern for all agricultural producers. Gene flow can happen from an organic or conventional field into a GE field just as it can from GE into organic, from organic to organic, or conventional to conventional. Producers share similar interests in reducing or eliminating cross-contamination and associated gene drift. Some task force members emphasized the responsibility of the agricultural community to implement practices to mitigate the risk of cross contamination. Indeed, Oregon has a long history of implementing coexistence practices in an effort to address concerns about cross-contamination. The potential strategies and ideas in this section are not policy recommendations and do not represent a consensus of the task force.

- *Agronomic practices:* Task force members described a number of practical activities that can help reduce the potential for cross-contamination, including: cleaning machinery, sealing containers when crops are transported, drafting contract that require best practices to reduce or eliminate drift, educating farms and volunteers about the concerns and tools to address cross-contamination.

- *Biological mechanisms:* There may be potential for biological tools currently in the research phase, such as GURTS (genetic use restriction technologies), including male sterility, which could alter the plants themselves in such ways to reduce or eliminate drift.
- *Buffers or physical barriers:* Task force members identified cages, greenhouses, high tunnels, and tree rows/forests as examples of physical tools that can reduce drift by impeding cross-pollination.
- *Communication and coordination:* Task force members noted that good communication and coordination between neighbors on strategies such as timing for crop planting or buffers can significantly reduce the potential for drift.
- *Control Areas:* Control areas, or growing zones, are areas that restrict the crops grown within their boundaries, through either requiring certain practices or excluding certain crops or types of crops. These could be either voluntary or mandatory in nature.
- *Distribution system:* Changes to the distribution system such as clearly designated vehicles for certain crops or segregated systems could reduce potential for commingling.
- *Isolation in space:* Producers space crops at such distances that risk of cross-pollination is reduced or eliminated. Isolation distances vary by crop, are dependent on local knowledge of conditions like weather patterns, and can range from approximately a half mile to more than three miles. The Willamette Valley Specialty Seed Association maintains a list of isolation distances<sup>25</sup> for its voluntary system. In discussing isolation in space task force members raised a number of questions related to liability and/or burden of responsibility: In the context of GE, is a GE producer responsible for planting far enough away from other crops to ensure that cross-pollination does not occur or should the non-GE producer plant far enough away to protect his or her crops?
- *Isolation in time:* Crops are planted at different times to minimize the risk of cross-pollination since crops flower at different times. Task force members noted that this can be an effective strategy, however, organic or non-GE producers are often the ones that need to delay planting, which can shorten their growing season and increase their risk. This concern is further discussed under liability.
- *Mapping/Pinning:* A map of crop locations (often described as a “pinning system”) would be a tool to facilitate communication among producers as they determine what and when to plant. For some task force members, mandating such a program raises questions about confidentiality for property owners.

A number of the above mentioned practices were also described by the task force as potentially helpful in instances where spray drift is of concern. Task force members noted that the tools and practices listed above are not mutually exclusive. For example, timing and isolation distances can be used in conjunction with one another; such an approach would require coordination among neighbors or new rules to establish requirements for growers of varying crops.

In addition to the practices described above, task force members made a number of observations about practices and coexistence. They noted that different crop varieties have different levels of risk. For example, they observed biopharmaceuticals or high amylase corn (high amylase corn has an enzyme that can impair the quality of cornstarch) might pose a greater risk. They also noted that difference among crops (such as pollination mechanism) could present unique challenges noting, for example, that corn pollen and sugar beet pollen would require different isolation distances. There are other differences between hybrids, self-pollinating, and open-pollinated crops, all of which can have impacts on coexistence and practices.

The task force took a closer look at two practices: mapping/pinning and control areas.

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<sup>25</sup> WVSSA Isolation Distances <http://www.thewvssa.org/documents.htm>

### *Mapping and Pinning*

The task force described a continuum of approaches (voluntary to mandatory) that is closely linked to mapping and pinning. Mapping and pinning is a system in which crop locations are identified. Some noted that for voluntary approaches to work they need to be “mutually beneficial” and participants need to recognize that there is a “shared risk.” Voluntary approaches must also be inclusive, meaning that all parties must have a chance to participate, to contribute to the decision making process, and have confidence that their perspectives will be integrated into the system. Some task force members identified the following as examples of inclusive, voluntary approaches to mapping and pinning: the Willamette Valley Specialty Seed Association (WVSSA)<sup>26</sup>, the California Seed Association<sup>27</sup>, and other seed associations in Washington, Idaho, and Eastern Oregon. Others noted that WVSSA’s voluntary system works well for the specialty seed industry because growers share an interest in not being contaminated. They pointed out that the relationship in a GE/non-GE scenario is unequal (in many but not all instances the non-GE farmer bears more risk from being contaminated than the GE grower does) and that a voluntary coexistence system only works when risk is shared relatively equally among growers. They noted that a voluntary sensitive crop registry in Illinois (DriftWatch<sup>28</sup>) had received very little participation from conventional and GE growers but high participation from the organic sector.

Mapping and pinning systems can incorporate Best Management Practices (BMPs) by, for example, incorporating isolation distances that are agreed to by members of the association. Such an approach is currently used by WVSSA and backed up by arbitration.

Task force members considered the implications of a mapping or pinning system separate from the state’s control area statute. Some expressed a need to be careful around issues of confidential business information (CBI), while others indicated that it might be possible to protect CBI from public records requests if that information qualifies as a trade secret. Task force members interested in a mapping and pinning system suggested that the information provided would help farmers make informed decision and may provide opportunities to implement tools that would not be possible without information about crop locations (e.g. buffer distances).

### *Control Areas*

Control areas may offer a way to manage on a crop-specific basis to address discrete issues, or they could be used to manage closely related crops on a statewide level. Oregon’s current control area statute<sup>29</sup> gives the state authority to deal with plant pest and disease issues. Some noted that it would be a significant change to add GE traits to that authority (i.e. classifying GE traits as a pest). Others interpret that the current control area law already provides ODA authority to regulate GE crops that have potential to be a “menace” to other crops but that adding GE to ODA’s explicit authority would allow the agency to make crop specific regulations; however, ODA interprets their control area authority as restricted to regulated GE crops. An alternative to a state-run control area could be a grower-defined “Voluntary Control Area” or a combination of voluntary and mandatory elements.

Some task members noted that the control area tool can be a flexible mechanism and is not limited to bans. For example, a control area could be used to establish BMPs with regard to a particular crop or area. Control areas for a particular crop could also vary in nature,

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<sup>26</sup> WVSSA Seed Production Pinning Regulations <http://www.thewvssa.org/documents.htm>

<sup>27</sup> California Seed Association <http://www.calseed.org/index.html>

<sup>28</sup> DriftWatch <https://il.driftwatch.org/map>

<sup>29</sup> 570.405 Department may establish control areas <http://www.oregonlaws.org/ors/570.405>

meaning that they could include BMPs in one area and a ban (or other practice) in another. Some expressed concern with any of these approaches, including BMPs and ban approaches, while others noted that there may be a potential marketplace benefit to Oregon if international markets see a control area approach as a signal that Oregon takes these issues seriously and can be a trusted trade partner.

Some task force members identified a few Oregon-specific crops where they felt potential control areas could be of benefit, including grass seed, specialty seeds, alfalfa (which is open pollinated and grown statewide), canola, wheat, and potential crops like Arctic apple. With the exception of Oregon's GE bentgrass control area, it does not appear that any other jurisdictions have adopted GE-specific crop management regulation, though a few states (Ohio<sup>30</sup> and Illinois<sup>31</sup>) have voluntary sensitive crop registries used to track where conflicts may arise and to proactively work out issues. The task force members had varied opinions about the potential success of such efforts.

A more complete description of Oregon's control area authority is available in Appendix 1.

### **Voluntary and Mandatory Approaches**

The voluntary to mandatory continuum is an overarching theme of coexistence. Regulations, implementation/education, enforcement, consequences, and marketplace influences shape what kinds of approaches can be taken along the continuum. Task force members noted that a key factor in coexistence is shared risk and mutual benefit by all parties. Many agreed that identifying the right balance between mandatory and voluntary approaches presents a challenge.

Some task force members feel that the diversity of agriculture sectors in Oregon creates unique needs that are not being addressed by the federal regulatory framework and that the variety of crops grown in Oregon present different levels of risk that are not addressed in a one-size-fits-all approach. In addition, there are regional differences that complicate Oregon's agricultural landscape. Some task force members contend that there is a need to assess appropriate approaches by crop and by sector. The absence of monitoring after GE crops are deregulated presents challenges in managing on a crop-by-crop basis. Task force members disagreed on whether a crop-by-crop approach for GE would be onerous, with some noting the complicated nature of many voluntary crop-specific programs and others citing the relatively small list of GE crops grown in Oregon, particularly open pollinated crops, which would be of primary concern. Others noted that while there are unique aspects of Oregon agriculture, the food processing industry is not unique in Oregon since many processors source ingredients from outside the state and ship products out of state. This raised concerns for them that Oregon specific standards might impede interstate commerce or international trade.

Task force members identified several approaches the state could take, ranging from mandatory regulation to voluntary systems. Regulations based on statute may be static, as compared to voluntary approaches or administrative guidance, and some felt that they might not be nimble enough to meet the challenges presented by an accelerating technology such as GE. Others were more optimistic about the potential for the state to be responsive. All agreed that a burdensome system would not help Oregon reach a goal of coexistence, though task force members disagreed on whether a mandatory state approach to GE would be burdensome or not. Some expressed concern that mandatory regulations are decided by people who lack full information about agricultural and manufacturing issues, noting that any decisions would need to have the right combination of people in the room to ensure that all relevant considerations are taken into account. Others suggested that

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<sup>30</sup> Ohio Sensitive Crop Registry <http://www.agri.ohio.gov/scr/>

<sup>31</sup> DriftWatch Specialty Crop Site Registry <https://driftwatch.org/>

ODA would be well suited to fill a decision making role. Some felt, based on their values, that decisions should be made and conflicts should be resolved by those who are closest to food, feed, and fiber.

Several task force members articulated a need for the state to have more tools to protect sensitive crops. A collaboratively devised best practices system put together by representatives of the diverse agricultural perspectives was described by some as a potential approach, either on a statewide or crop-by-crop basis. That voluntary approach could have a regulatory or legal backstop (e.g. “baseball style” arbitration).

There were varied opinions among the task force members about the appropriate role of the state in helping to manage coexistence issues. Some do not see a coexistence problem now and therefore do not see a need for state action, or would prefer for any actions to be voluntary as such an approach would be more nimble and allow local context to inform actions. Others see clear issues with the current approach, particularly for the organic and some export (domestic and international) sectors, as these growers are vulnerable to loss of sales and customers if their crops are contaminated from GE crops. They see state action as an important component of protecting all sectors of Oregon agriculture as well as ensuring consistency and avoiding a “patchwork approach.” They noted that voluntary approaches work best when participation is mutually beneficial; however, in the case of GE crops, drift is primarily (but not exclusively) a concern of non-GE growers, especially organic growers. They say that similar challenges have arisen in voluntary approaches for commodity or cover crops where risk is not shared and therefore participation is not mutually beneficial. They also express concern that a voluntary approach cannot address “bad actors” who wish to remain outside the system. Others pointed to the high levels of participation in many voluntary systems (e.g. WVSSA) and note that there may be ways to incentivize participation. Others noted that some voluntary programs lack clear guidance and can leave producers and/or consumers wondering what program compliance actually means.

### **Legal Liability, Compensation, and Enforcement**

The task force discussed legal liability, compensation and enforcement issues related to a coexistence system – how would liability be determined, how would compensation for damages be managed, and how would enforcement occur? With respect to issues of coexistence, these issues arise where a GE trait enters a non-GE crop, resulting in food or feed that has an undesired GE presence. Because organic and many foreign markets are not tolerant of GE presence, some task force members are concerned about potential damage or loss resulting from GE contamination.

A common theme running through these topics is risk – who bears risk and how is it managed? There were diverse opinions among task force members on these questions. Some think that risk is difficult to assess, leading to difficult or unmanageable enforcement. Others think that risk is not difficult to define if it is looked at in terms of economic harm from contamination in a marketplace that demands non-GE products. There are currently no testing standards that are agreed to across all markets for determining liability, and in some cases there is a lack of technical capacity to test. There was some agreement that openly pollinated crops are subject to greater risk than other crops.

There were also a variety of opinions regarding who should bear responsibility for compensation. While some think it should be the trait owner because the owner benefits from marketing and selling GE traits, others do not share this view. Some hold the view that testing and tolerances should be incorporated into any kind of compensation program, though testing may present complications with regard to the specifics of seed utility licenses. Another facet of the risk and responsibility question is whether willful or neglectful actions should be treated differently than unintentional harm. Some task force members considered ways to mitigate or avoid risk leading to compensation. For example, they considered alternative technologies or opportunities to develop GE crops with pollen that does not



include GE traits or cannot transfer their traits. Others noted that there are potential scientific opportunities to address the challenges of coexistence (but they are not required of developers) and noted social pushback and economic and technological obstacles as barriers to their development in the near future.

Some perceive that liability and market loss risk to producers and processors increases with zero-tolerance (or near zero-tolerance) requirements for cross-contamination. Some task force members speculated that litigation on this topic could potentially affect the cost of food to consumers and negatively impact Oregon producers and processors. Others clarified that the task force's conversations about losses to organic producers mean marketplace losses as a result of compromised seed or product purity, and not loss of organic certification (which requires practices to be in place to mitigate risk of cross-contamination but does not require product testing for inadvertent GE presence). There is perceived liability to food processors associated with zero-tolerance requirements in finished products and processed foods, especially those that allow citizen lawsuits.

A clear approach to assessing liability and providing for compensation was supported by several task force members as a method of alleviating the negative consequences of disputes between farmers. These members note that the agriculture sector as a whole does not benefit when farmers are pitted against one another. The following list describes several potential ideas that emerged from the task force's discussion, though none of them represent a consensus of the task force.

- *Compensation fund.* A compensation fund managed by the state could be used as an alternative to assessing responsibility. Concerns with this approach include a desire not to put the burden of risk on the public instead of on companies that benefit from the sale of GE traits. Such a program could require growers to abide by certain practices in order to qualify for compensation. Another approach to a compensation fund might be a “transition fund” that could help growers cover the costs of coming into compliance with a control area or BMP system.
- *Insurance program.* A state-run insurance program for compensating harm was another idea that was put forward. One task force member recommended a voluntary insurance approach to discourage fraudulent claims. Some task force members articulated concerns with an insurance program, including an aversion to “welfare farming” and a concern that a public insurance system, like a compensation fund, puts the public in the position of bearing the risk in the system. Some wondered whether an insurance program should compensate farmers who, in the event of a ban, could no longer grow their preferred crop.
- *Fee system for enforcement.* A fee system could fund an enforcement program by assessing fees on either growers (of GE or non-GE seeds) or companies that sell GE seeds in Oregon. Enforcement could apply to a variety of programs including a compensation fund, insurance program, control area program, or a mapping/pinning system.
- *Farmer-to-farmer approach.* Also known as a “handshake” approach, this is the current system in use to deal with GE issues. Some praise this system because it relies on farmers being good neighbors to each other and keeping abreast of nearby growing issues. A farmer-to-farmer approach can be augmented with voluntary growing associations where growers agree to abide by certain practices in order to coexist. Some express concern with this approach because it contains a high degree of variability resulting from a ‘patchwork’ of different agreements and does not embody a statewide approach. Others noted that the state’s preemption legislation<sup>32</sup> on GE seeds and crops was intended to prevent a patchwork approach.

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<sup>32</sup> Oregon Senate Bill 863. (2013). <https://olis.leg.state.or.us/liz/2013S1/Measures/Overview/SB863>

Labeling presents additional considerations for legal liability. For example, would a compensation program apply only to harm from contamination, or would it extend to lost market share from potential labeling requirements? Some speculated this and other associated issues would be fought in the courts without a clearly outlined approach.

## **Consumer and Grower Information and Choice Topics**

### **Food Safety**

The perspectives on GE food safety range from potential benefits through improvements to food safety, to concerns about negative impacts to human health from consuming plants that have been altered through genetic engineering. Task force members considered food safety from multiple perspectives, noting that some food safety issues apply to both GE and non-GE issues.

Some noted potential benefits of GE technology on food safety, for example reduced aflatoxins (naturally occurring toxins produced by molds and fungi) in Bt corn as a result of reduced insect invasions. The FDA approves GE foods for human consumption using the principle of substantial equivalence, which means that the final product of a GE process (corn, for example) is determined to be substantially equivalent (i.e. not materially different) from non-GE corn. Currently, all commercially available GE products intended for human consumption in the US have been determined to be substantially equivalent to their non-GE counterparts and are determined safe by the FDA. Concerns about GE and food safety center around questions about the duration of studies of GE impacts to human health, and concerns about the sufficiency of the voluntary regulatory regime for testing and safety of GE products. Others noted that all current commercial GE crops have undergone FDA review, and suggest that the risk of FDA legal action due to adulteration of the food supply with new GE products make FDA review “effectively” mandatory. Some are not confident in substantial equivalency determinations by the FDA because, they note, these determinations rely in part on data provided by the developers and not independent safety tests. Some would prefer that the precautionary principle be applied instead of substantial equivalence. On the other hand, others raised an economic concern that extensive food safety research on GE products reaches a point of diminishing returns.

A related concern is that conventional breeding techniques, which have the potential to introduce food safety risk, have no regulatory oversight or long-term safety study requirements; some noted that GE products undergo more regulated testing than conventional products.

### **Consumers Information, Education, and Public Perception**

A major topic was that the scientific and regulatory universe of genetic engineering is very complex, which has implications for general public understanding of these issues. The technology is complicated and difficult to explain, and often there is no distinction in the public conversation about the various traits that can be incorporated through genetic engineering. GMO, non-GMO, GMO-free, biotech, sustainable, GE, natural, bioengineering, and genetic modification are used loosely in the public conversation, which adds to the confusion. Task force members observed that the rhetoric on both ‘sides’ of this issue exaggerates claims to bolster their arguments. They acknowledge that there is a large amount of misinformation as well.

Consumer understanding of existing regulatory processes for testing is lacking. Consumers may perceive that there is limited regulatory oversight for food safety, for example that FDA does not have sufficient consultation or testing processes, or that labeling is not currently required in the case of positive or negative changes to nutrition or safety. Though they agreed that this is a common public perception, task force members were not in agreement about whether the perception reflects reality.

Some task force members articulated that consumers want information so they can make their own choices based on personal or environmental values. They note that some consumers perceive that there are negative health effects from GE food and related practices. This is closely related to the issue of labeling GE foods. Others expressed that scientific studies do not support the perception of negative health effects. In the case of risk science versus risk perception, the perception of risk may be stronger than the science, they say. Some task members noted that some consumers may perceive a prominent GMO label as a warning.

Task force members generally agreed that public education is needed – not only about genetic engineering but also about the food system in general. An observation was made that the agricultural sectors in Oregon tend to be separate, and that the limited coexistence here has led to a more polarized approach to these issues than in places like California that have more coexistence among GE, conventional, and organic practices.

### **Promotion**

Promotion refers to the marketing of GE or non-GE seeds, food and feed. This is closely related to certification as all promotional claims, including labeling claims, must be substantiated, but not all substantiations must be certified. Organic labels on food are a good example of a voluntary promotion coupled with a mandatory certification program. At present, certification is not required for promotional claims on presence or absence statements for GE ingredients. However, FDA does specify substantiation – first through testing, if possible, or certificates of authenticity (COAs) if not<sup>33</sup>. Task force members considered promotion from several perspectives, including where it blends with certification (discussed below).

Some task force members tied promotion to health claims, while others articulated a distinction, which is that promotion related to certification simply makes a statement as to what the product contains, and stops short of making any health claims. Some task force members interpret some current non-GE product promotion as misleading if no GE counterpart exists for that food (e.g. some cases of advertising Himalayan sea salt as “non-GMO”).

Task force members identified a potential competitive advantage if Oregon had a robust certification process for GE or non-GE foods. It would signify to consumers that Oregon’s growing and processing can be trusted because of rigorous testing and certification and promotion. Task force members had differing viewpoints about whether the state should play a role in supporting the promotion of GE or GE-free products.

### **Certification**

Uncertainty and inconsistency were a common thread in task force discussion about certification. The core questions centered on who should be required to certify (if anyone), who would bear certification costs, and whether certification should be voluntary or mandatory.

Task force members discussed each of these aspects of certification in the three separate but related categories of food, seed, and animal feed. With regard to food product certification, some members were generally satisfied with the current voluntary product certification system. This system relies on a third party certifier, such as the Non-GMO Project,<sup>34</sup> to certify that products do not contain GMO ingredients. Some members contend that the certification burden should be placed on the

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<sup>33</sup> FDA Draft Guidance (2001)

<http://www.fda.gov/food/guidanceregulation/guidancedocumentsregulatoryinformation/labelingnutrition/ucm059098.htm>

<sup>34</sup> Non-GMO Project Product Verification <http://www.nongmoproject.org/product-verification/>

manufacturers of products containing GE, while others said that the certification cost should be the responsibility of the party making the claim because the premium price would support certification costs. Regardless of who is required to certify, it was assumed that any cost of certification would be either absorbed by the company or passed on to growers and/or consumers. Some noted that food manufacturers currently pay for ingredient testing or negotiate a certificate of authenticity (COA) with suppliers, depending on market factors, regulatory requirements and/or legal liability. They suggest that Oregon's relatively small production volume and purchasing power is a factor that could put smaller Oregon food manufacturers at a disadvantage. Other task force members expressed concern that diverse certification requirements from other nations or states may put additional burdens on Oregon food manufacturers and growers. Some felt that even with a robust certification system, consumers might not fully understand what certification claims really mean.

In addition to the questions surrounding food product certification, there are questions surrounding certification for seed production. Some would prefer a voluntary grower certification program similar to organic certification. Others were concerned that such a system places the certification burden on non-GE growers when 'contamination' of their product is coming from GE growers. In this sense they would prefer that GE growers or manufacturers carry certification requirements and costs.

Most task force members agreed that it would be valuable to have a clear policy structure to provide certainty of process and protection to business to achieve their respective goals.

### **Labeling**

The task force considered issues around labeling both GE and non-GE products in both mandatory and voluntary systems. The intended purpose of a labeling system is to provide consumers with more information about their food with regard to genetic engineering. Some say that enables consumers to make more informed choices. Others contend that consumers currently have choice in non-GE and organic products and that the specifics of many labeling measures under consideration contain flaws that undermine the intent of providing choice.

Current labeling proposals do not require or preclude indicating the purpose of the genetic engineering (e.g. if the crop was engineered for pest management or for improved nutrition). Some noted that consumers typically do not have access to information about genetic modification by traditional techniques, such as whether a head of cabbage is green or red. For some an overarching theme of labeling is that the specific provisions of labeling laws matter a great deal, especially with mandatory labeling. This is because many policies are theoretical or untested - they are either new (such as Vermont) or in process (such as current initiatives and bills in a number of US states). In their discussion of labeling, task force members raised an important question that remains unanswered: if mandatory GE labeling were to occur in Oregon, how would non GE-foods be verified as such?

Mechanically, labeling proposals and laws fall into one of two categories: voluntary labeling and mandatory labeling. Certification of non-GE can be offered by a state agency, by a private group based on state rules, or entirely privately. The Non-GMO Project is an example of a private voluntary labeling program. Some suggested that the state could assist industry by providing a voluntary certification system based on federal standards, similar to the organic certification program. Currently, all GE labeling in Oregon is voluntary market-driven labeling.

Economically, it may be manageable for food manufacturers to add or change labels to reflect a mandatory labeling law. According to some task force members, however, with both mandatory and voluntary labeling supply chain costs will increase as costs accumulate from certification, record-

keeping, segregation of supply streams, differences in distribution to states with varying label requirements, and liability, though estimates of increased costs vary widely.

A number of concerns around mandatory labeling revolve around consumer and public perception of labels, and the relationship of GE to human health. Some expressed a concern that a mandatory label administered by the government carries an implied or perceived safety issue where there is not one. They maintain that in a voluntary labeling system, it is clear that the labels are market-driven and not related to public health issues. Others view labels as good information for consumers to make their own informed choices, in much the same way that concentrated juice and country of origin labels appear on many products now - and that a mandatory label is not always associated with health or nutrition information.

Task force members examined some regulatory considerations and potential barriers to a mandatory labeling program for GE. Some articulated FDA's approach to GE and labels, which is that they look for substantial equivalence (i.e. the final product of GE must not be materially different from the corresponding non-GE product) and do not require labeling based solely on process but do require labels when modifications affect nutrition or safety. These task force members noted that in the case of GE, if there is substantial equivalence FDA does not require a label to indicate the process by which the food was made. Currently, FDA has deemed all GE foods in the marketplace to be substantially equivalent to non-GE foods, though some note that this may change as new GE crops that have been modified to improve food safety (e.g. Innate potatoes) enter the marketplace. Some pointed out that both voluntary and mandatory labeling is subject to federal requirements in the sense that the language must be truthful and not misleading. Some task force members articulated a legal concern, which is that mandatory labeling could be challenged under constitutional amendments including free speech. Some expressed a concern about potential mechanical difficulties of complying with multiple states' varying labeling requirements. Others noted that mandatory labeling could be easy to comply with if requirements are easy or straightforward.

Task force members articulated some economic downsides and upsides to labeling GE in both voluntary and mandatory scenarios. Under a voluntary system, the consumer chooses to pay for the increased cost of labeling by choosing products with an independent certification. In a mandatory system, costs are incurred by those that need to comply with labeling as well as the public sector for regulatory and enforcement costs. Some have ethical concerns about imposing labeling requirements (and potential associated costs) on low-income people, while others see an opportunity for mandatory labeling to provide information to low income consumers without the premiums associated with voluntary labels such as organic and Non-GMO Project. Others see an equity issue for small Oregon processors who have less leverage to source certified ingredients to comply with non-GMO labeling rules, if they choose to change their ingredients. Others state ethical motivations in their desire to require labels on GE foods.

Some say that mandatory labeling requirements, regardless of how easy they would be to comply with, could change market conditions and note Europe as an example of a marketplace where GE foods are rare. Some are concerned that those conditions will disadvantage some food producers and potentially put them out of business. Others see potential for some producers to gain an advantage and create new business opportunities. Some noted that price changes in response to labeling may not occur predictably across the board. In Oregon there may be a lack of clarity around how animal feed and human food would be monitored and certified in a mandatory labeling regime. Some noted that in the food manufacturing sector, food manufacturers have liability for claims they make on labels. They expressed a concern that liability increases with mandatory labeling, especially when citizen lawsuits are allowed or when laws do not require damages to be shown.

Some see the current voluntary system as allowing for mutually beneficial coexistence. In this system the voluntary national organics program and independent verifiers such as The Non-GMO Project allow for a mechanism for those seeking non-GE market to participate in these markets. Others note that there are costs and infrastructure associated with testing to prove products are GE-free, whether it is the GE or the non-GE industry bearing the cost. Others noted that the National Organic Program standard requires best management practices (BMPs) to mitigate cross-contamination risk and does not require testing for inadvertent GE presence (not zero-tolerance); however, some producers and markets (including international markets) do not allow any detectable presence (zero-tolerance).

## **Economic and Social Topics**

### **Food Supply and Climate Adaptation**

Food supply refers to the amount of food that can be grown to meet the demands of a growing local and world population in the face of a changing climate. Food supply is impacted by factors such as crop yield, water availability, and resistance to catastrophe. Task force members described a number of perspectives related to food supply and climate adaptation. For some, GE developments could hold significant potential to increase food supply and security, particularly in the developing world but also in Oregon. Traits that could be enhanced through GE, such as drought resistance and increased nutritional value, are cited as traits that hold potential for food supply improvements. Some say, however, that the advances in worldwide food production in recent decades are a result of better agronomic practices and are not attributable to GE. Others are optimistic that many throughout the world have and will continue to benefit from advances in GE such as pest-resistance in small vegetable crops. Some task force members also described a potential food supply vulnerability associated with the consolidation of seed suppliers and a corresponding potential loss of seed diversity. They say that with less seed diversity there are fewer alternatives in the case of disease or pest outbreak. Others are less concerned about seed diversity and point to public seed banks to ensure continued diversity of available crops.

### **Market and Tolerance**

Market factors are important to supporters and opponents of GE technology, as well as consumers, growers, and food manufacturers. As such, task force members vigorously discussed the topics of market impacts of GE and market tolerances for GE products. There were differing perspectives as to whether farmers stand to benefit economically from adopting GE technologies. For some, GE represents an opportunity to increase revenue through increased productivity and reduced input cost for supplies like pesticides. For example, with perennial crops like alfalfa the initial cost to the farmer may be higher but long-term benefits may be accrued to both the farmer and, eventually, the customer. Others note that GE crops can have higher upfront costs (e.g. purchase of seeds) and any increased revenues could be associated with farmers who are farming at a larger scale, which allows them to benefit from economies of scale. They suggest that economic benefits from large-scale GE farming are concentrated in the production of the largest GE crops of cotton, corn, and soybeans, which are not widely produced in Oregon. Others question this logic, noting that the up-front cost associated with GE production may be scalable and therefore proportionally the same for small and large farms. For some task force members there was a concern that a GE-dominated marketplace would lead to the loss of available non-GE seed varieties, which could make non-GE growers more vulnerable. Others noted that non-GE crops can command a price premium but may also be more expensive to grow. Some members also observed that there are differences between commodity crops and specialty crops and that specialty crops make up a higher percentage of Oregon

production. On the whole, little research has been conducted on GE effects on economic and social farm sustainability in Oregon.

From the consumer and manufacturer perspective, there was a general understanding that many consumers lack information about GE. It was noted that consumers may benefit from reduced costs when GE helps to increase productivity and reduce production costs. In addition, some task force members noted that there could be significant potential markets for GE as more consumer directed traits (i.e. nutritional enhancement) become available. Some task force members described a growing number of both domestic and foreign markets that have limited or no tolerance for GE and challenges with the current market approach in meeting this demand. For example, they said, processors who want non-GE products are concerned about ensuring that their supply chain is GE-free and that there are costs (e.g. testing) associated with assurance. Some describe the lack of infrastructure and regulatory system to segregate GE and non-GE crops as particularly important topics in Oregon.

### **Ethics and Values**

While the issue of genetic engineering has many technical and regulatory components, issues of ethics and values are in some ways the crux of every difficult policy dialogue. Of particular importance to the task force are the values of justice and equity. Justice is addressed largely in the ‘Coexistence’ section by topics including legal liability and compensation. Equity runs through many topic areas and touches on issues of fairness, property rights, and ethical obligations to a growing and changing world. Task force members articulated several perspectives and raised some questions on this crucial topic. Among the most frequently discussed ethical issues in the task force was the desire for growers to choose what to plant. On one hand there are concerns that prohibitions like the one passed in May 2014 in Jackson County<sup>35</sup> impose undue restrictions on personal freedoms. Such restrictions are said to place inequitable burdens on growers who plant GE crops. On the other hand, those producers that grow non-GE crops, particularly organic, express concern that their own freedom to plant what they want is limited by the existence of GE crops nearby. The risk of drifting pollen from GE fields to non-GE fields is a significant concern, particularly from non-GE exporters and organic producers whose market share might be at risk if cross-contamination occurs. Cross-contamination into GE fields is also a concern, with damage to sugar beets from nearby chard fields being the primary example. Such debates highlight some of the equity concerns that arise in the topics surrounding GE.

Some task force members raised ethical concerns about the influence of corporate seed producers on policy and the concentration of ownership or property by large companies. For some, the concentration of ownership and restriction of GE development to large companies means there is slower development of new crops by smaller companies and public researchers because of the control of intellectual property. Others noted that while patents have been a large barrier to entry by small seed companies and farmers, this is changing as patents elapse. They suggest market and regulatory obstacles have grown at the same time, which also increase costs and make it difficult for small operators to create or manage GE products. It is worth noting that this is an issue that extends beyond the GE topic. Others noted that to date, GE product development has been largely restricted to market-driven traits and wondered whether the kinds of attributes that might benefit developing countries have sufficient market “pull” to support their development. In this sense they suggest that the potential value of GE has been concentrated in large developed-world farms, particularly on corn, cotton, and soybeans.

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<sup>35</sup> Jackson County Measure 15-119  
[http://ballotpedia.org/Jackson\\_County\\_Genetically\\_Modified\\_Organism\\_Ban\\_Measure\\_15-119\\_\(May\\_2014\)](http://ballotpedia.org/Jackson_County_Genetically_Modified_Organism_Ban_Measure_15-119_(May_2014))

Another concern that arose for some task force members was the concentration of funding, particularly public dollars, into GE breeding, which is presumed to reduce the available resources for conventional breeding. Alternatively, some task force members feel that not enough GE research funding goes to public institutions like universities because granting authorities (USDA) don't consider them viable enough to keep up with large corporate research programs.

### **Licensing, Seed Ownership, and Intellectual property**

Most GE seeds are produced through patented genetic engineering processes and are sold with contracts that require that growers abide by licenses and detailed agreements that contain restrictions on the use of the seeds. The company (generally large agribusiness companies) retains ownership of the seed and is protected by intellectual property laws. Task force members discussed the implications of seed ownership and licensing, and of operating in a world where these technologies are primarily developed in a market-driven climate.

One of the primary concerns related to licensing, seed ownership, and intellectual property is the concentration of seed ownership by seed producers and associated limitations on other breeding and research efforts. Specifically, a concern arises that if seed producers do not have the potential to benefit from a product then there is little incentive to invest, which will inhibit research and further development on seed production techniques. Others noted that in a market-based economy, companies are driven by demand and are rewarded when their supply meets a demand. In other words, companies will keep producing things that people buy. Others wondered whether a market-based economy sufficiently rewards the development of seeds or traits for countries that have less money, suggesting that the market may not balance needs across the globe. Some noted a contradiction in terms where GE foods can be found to be substantially equivalent to non-GE foods, yet the GE traits they contain are novel enough to be patented. Others note that substantial equivalence refers to a regulatory finding of food safety and is not synonymous with genetic equivalence.

Additionally, some noted that public sector research on GE crops is limited or difficult because researchers should obtain approval from seed owners in order to conduct research. As a result even traditional variety trials conducted by independent public institutions are becoming difficult to conduct. Others expressed concern that research and development funds could diminish if core GE crops are forced off the market.

### **Trade and Tariffs**

Trade is essential to Oregon's agricultural and food processing sectors and, as such, the international and domestic aspects of GE were an important topic of conversation for the task force. Task force members focused their observations on consumer market aspects of trade as well as government and regulatory issues. Oregon has a recent history with international reactions to GE. (In the summer of 2013 GE wheat was unexpectedly found in an eastern Oregon wheat field. Two Asian markets, Japan and South Korea, put holds on future Oregon wheat purchases for several weeks as a result.) Task force members see a competitive market advantage for Oregon if the state is responsive to international trade concerns from a growing number of places with a low tolerance for GE such as Japan and the European Union. Others see a trade liability for Oregon as a result of local efforts to require labeling of GE products that are inconsistent with other standards and bans on production of GE agriculture. They note that markets have responded differently to GE crops, with countries placing varying degrees of restrictions on GE importation. Moreover, they note that in countries that accept GE but require labels there are varying tolerances on the amount of GE allowed and on timelines for approval. Inconsistency between national regulations and World Trade Organization (WTO) policies can lead to WTO involvement in trade issues, including lawsuits. The lack of trade harmonization at the international level creates significant trade challenges for many of Oregon's agricultural producers and processors.



A similar dynamic exists at the domestic level as producers and processors work to comply with diverse state regulations. Task force members described segregation of GE from non-GE streams throughout the supply chain as a practical challenge for both domestic and international trade that affects both GE and non-GE producers and processors alike. As processing and transaction costs associated with segregation, verification, and litigation increase, the overall cost of goods rises. Other task force members were concerned about interstate trade issues in which Oregon, given its relatively smaller market, may be more vulnerable than larger states where GE-related trade requirements could generate leverage to create significant, even national changes. Task force members were generally in agreement that trade and tariff issues necessitate careful coordination with trading partners.

### **Occupational Safety**

Occupational safety refers to the safety of farm workers. Occupational hazards include exposure to chemicals and accidents involving farm equipment. Some task force members articulated concerns about increased worker exposure to herbicides corresponding with increases in herbicide-tolerant crops. On the other hand, there may be decreased exposure to insecticides because pest-tolerant crops require less insecticide to control those pests (i.e. Bt corn). The net impact on occupational safety is unclear. For some, the relative toxicity of pesticides for the next generation of GE, such as 2,4-D and dicamba, was a concern. Others noted that improvements in application technology and farm awareness have contributed to reductions in pesticide exposure, and cite glyphosate's relatively low toxicity and common use in GE operations as a potential positive development for occupational safety.

Task force members also identified a number of topics that may have potential impacts on occupational safety but are largely unstudied to date, including the implications for spray timing and harvest and associated impacts on worker safety. Some task force members also hypothesized that the no-till operations associated with GE may reduce farm worker exposure to injury from heavy equipment. Others noted that large-scale agricultural operations, often associated with GE, may reduce back injuries from manual weeding.

## **Environmental Topics**

### **Biodiversity**

Biodiversity is the amount of biological variation in a system. In the context of agriculture, genetic and species biodiversity can be an important measure of ecosystem health; a healthy ecosystem provides ecosystem services to people that include benefits such as water filtration and pollination. Biodiversity is relevant to the conversation on GE agriculture because of implications of GE practices to biodiversity on farms (pesticides, weeds, and wildlife) and on diverse seed availability for farmers.

Task force members expressed both concerns and benefits regarding potential impacts of GE agriculture on biodiversity. Some task force members were concerned that GE agriculture might pose negative impacts on non-target species (e.g. increased pesticide runoff from a GE crop field leading to a loss of aquatic diversity). Native plant and weed diversity was of particular concern to a number of task force members. The issue here, they say, is that the effective elimination of weeds from GE fields may cause a loss of weed diversity. One example cited by task force members is the loss of milkweed in the Midwest, which some associate with the reduction of monarch butterfly populations. Additionally, some task force members described a concern that rapid adoption of GE seeds may result in a decline in the diversity of the available seed base for growers in the future. Others were less concerned about (or unconvinced of) impacts to biodiversity from the use of

GE crops. Some noted that there might be an overall reduction in the use of broad-spectrum pesticides when GE crops are used because farmers can use targeted applications of less toxic herbicides (e.g. glyphosate tolerant crops) or apply no insecticides (e.g. plant incorporated BT crops). Some task force members noted that some GE developments increase a crop's direct defenses to pests, which, they suggest, reduces the need for pesticides that may negatively impact biodiversity.

### **Chemical Load**

Chemical load is a term used to describe the amount of chemical, total or individual, in an environment. Chemical load may refer to chemicals in plants, soil, water, air, or animals (including humans). It includes chemicals such as pesticides that are used to protect plants from weeds, diseases, and pests. GE technology has the potential to change the chemical load in a dynamic way as it impacts the volume and method of chemical delivery. Additionally it has relevance to pesticide resistance and its associated impacts.

Task force members discussed a number of topics related to chemical load in plants. Some task force members saw the use of GE crops as a means to reduce pesticide use and reduce the overall chemical load associated with agriculture: by embedding traits in GE crops that do the work of insecticides there is an overall reduction in the use of applied insecticides. A number of task force members offered an alternative view, expressing concern that the use of GE crops can lead to insecticide resistance in pests, which in turn can lead to the increased use of insecticides if new types of resistant varieties are not available. In a related vein, there is concern that some herbicide-resistant crops, particularly those resistant to Roundup and 2,4-D, facilitate the development of herbicide-resistant weeds, causing the use of other herbicides, which may be more toxic. Some task force members felt that these concerns could be ameliorated through various management methods such as herbicide rotation. Depending on one's views on the above, GE crops can be viewed as having positive or negative impacts on water quality, biodiversity, soil, and health.

### **Crop Yield Stability and Land Utilization**

Crop yield stability is reliability of the amount of a crop produced in a given area or in a given period of time. Some task force members articulated a potential opportunity for GE crops to improve crop yield and land utilization. For example, drought tolerant crops may allow growers to use land that would otherwise be unavailable, though GE is only one method for developing drought tolerant crops. Moreover, these traits may afford farmers some measure of environmental risk mitigation from impacts like drought or pest infestation. Yield can also be improved through the use of GE crops, if loss from pests is reduced or if crops can be rotated more quickly. Other task force members questioned the net effect of GE in improving crop yields, suggesting that the increase in crop yield in recent history may be due to improved management practices and plant genetics and not the use of GE. Those that hold this view are concerned that benefits from GE crops may be temporary, and point to alternative management practices to mitigate environmental risks which do not present the potential risks of GE.

### **Gene Flow**

Gene flow occurs when genetic material from one organism finds its way into another, through horizontal gene transfer or sexual reproduction (pollination). The major environmental concern with gene flow into the environment is that GE plants can spread. In addition, they can also cross with wild and feral species potentially transferring undesirable or uncontrollable traits into the environment. Some task force members noted that attempts to control those traits may result in increased use of pesticides.

The environmental gene flow issue is closely related to cross-contamination of GE genetic material into non-GE crops. See 'Coexistence.'

## **Pest Management**

Food growers engage in a constant struggle to manage pests. Pests include weeds, insects, rodents, pathogens, and other creatures that threaten crop health or yield. Common pest management techniques include the application of pesticides (such as insecticides or herbicides) to crop fields. The majority of GE crops in commercial use have been engineered to resist pests or specific herbicides in some way. For example, Roundup Ready varieties are resistant to the herbicide Roundup, and Bt crops contain a biological pesticide to help them resist specific insect pests.

Task force members articulated a range of concerns and benefits related to the potential impacts of GE agriculture on pest management. A major topic area was the use of glyphosate (Roundup) and glyphosate-resistant (Roundup Ready) GE crops. Some task force members articulated a concern that resistance to glyphosate develops in weeds in GE (and non-GE) cropping systems, but is accelerated by increased use of GE crops. Others posited that accelerated glyphosate resistance is a result of improper management of pesticides, and not an issue with the use of GE crops per se. Concern about the lack of a consistent program to teach proper pesticide management was shared broadly by task force members. Others noted a need to incentivize adoption of pest management strategies. Some task force members noted that GE crops may benefit non-GE crops by reducing the overall pest population and cite maize in the Midwestern US as an example of this.

A cluster of concerns and benefits centered on pesticide runoff and impacts to health. Some described a general concern about potential impacts on human health of consuming GE crops or animals that have consumed GE crops; there was also a concern about the potential impacts on wildlife that consume GE crops. Some task force members expressed a related concern that toxicological studies conducted to determine impacts of GE agriculture on wildlife and humans have not been conducted over a long enough duration to fully understand potential impacts. Others posit that GE crops have been on the market on a major scale for nearly twenty years and that studies show no evidence to demonstrate negative impacts to wildlife or human health. A related health concern expressed by some task force members is that water quality is impacted negatively if increased pesticide runoff (due to increased application on herbicide resistant crops) makes its way into streams. Some countered that pesticide (i.e. insecticide) runoff decreases where Bt (*Bacillus thuringiensis*) crops are used, since these crops impart insect resistance directly to a plant's genome. Still others worry that the effects of Bt crops and other GE technologies are fleeting and point to Bt-resistant insects and shifting pesticide application patterns as an example of this.

## **Soil Impacts**

Soil is impacted by farming practices, including pesticide application and mechanical practices such as tilling. Task force members considered the potential impacts of GE technology on these classic practices. Of particular concern were unintended impacts on soil from GE; for example, reduction of microbial communities in the soil and the killing of roots in non-target species due to the use of glyphosate. Another concern was possible impacts of Bt plants on soil due to the potentially higher amounts of Bt than when it is applied externally. Some noted that GE might cause a reduction of soil loss due to the increased use of no-till or low-till practices. Others suggested that this potential benefit maybe be more common in states where large scale GE crops are grown.

## **Water Quality**

Water quality and water quantity are important measures of environmental and economic health. Water quality refers to how clean the water is - how well it supports beneficial uses such as fishing, swimming, and drinking. Water quantity refers to how much water there is for in-stream health, and how much water is available for irrigation. Task force members articulated several important tradeoffs with regard to water topics. Some suggested that studies show an overall reduction in the use of insecticides with the introduction of insect-resistant GE crops, particularly in areas that have grown large acreages of crops like Bt corn and cotton; others point to both increases and decreases in

herbicide use. As weeds have developed resistance to some herbicides (e.g. glyphosate) there has been a corresponding need to augment herbicide application or use other herbicides. As a result of the increase in herbicide use, some of the water quality benefits realized in the early years of GE may diminish over time.

For some there is concern that in both conventional and GE agriculture new pesticides have a higher measure of toxicity and volatilization. It was noted that the state of Oregon has a number of voluntary programs and regulations to address water quality issues, and that Oregon currently has no water quality exceedances for glyphosate, the most common GE-related herbicide. It was also noted that GE holds potential to provide efficiencies in water use. For example, more efficient weed management may mean that less water is lost to weeds and more water is available to the crop and potentially other resources. Others described potential future water quantity benefits from drought tolerant GE crops, but these benefits are difficult to quantify. Regarding the practice of tilling (cultivating the soil), there may be less soil loss from erosion and impacts to water quality from GE crops (such as sediment transfer) because they allow weeds to be managed with herbicides rather than cultivation of the soil. In addition, some suggested that higher organic matter in soils associated with no-till systems may provide better water retention and thus lower drought stress for crops. Others note that many conventional farmers also use no-till cropping systems to reduce soil loss due to erosion from their fields and that the practice may not be widely adopted in Oregon.

## **Existing and Potential Legal and Policy Topics**

### **Oregon Authorities and Statutes**

Task force members identified several legal and policy concerns at the state level. Concerns range from values to practical implementation. Generally, task force members recognize that the grower base in Oregon is very diverse and appreciates the concept of their neighbors' right to farm, while simultaneously wanting to protect both existing and emerging markets.

Most concerns at the state level pertain to how a regulatory program for coexistence could be designed and implemented in a way that would be fair and promote good communication among farmers. Some expressed a concern that adopting rules of compliance within state government may secure strong support from one grower group while inviting opposition from another grower group. For example, if the legislature granted ODA the authority to create production zones to separate competing seed crop types (i.e. separating chard from GE sugar beet seed production) the system would be favored by those with new protections, but would result in a loss from any grower who was not in the "right" zone.

On a practical note, some noted the challenge of designing and administering a successful program. ODA noted that they would likely need to secure additional resources if their regulatory role over GE was expanded, meaning they do not currently have the resources to implement and enforce any new regulations on GE. ODA also noted that prior efforts to use their control area authority to regulate canola in the Willamette Valley were met with intense legal and political interest.

Some task force members support a state level regulatory approach and feel it is the most appropriate avenue of intervention, in the absence of federal direction. Others favor a totally voluntary approach. Some noted that currently, ODA does not have statutory authority to make stewardship protocols that are market-based, as opposed to pest- and disease-based protocols. ODA has authority over food labeling in general and has adopted FDA statutes on labeling. The agency currently prioritizes enforcement of labeling according to food safety risk.

### **Federal Authorities and Statutes**

The task force was given an opportunity to speak with representatives of the three federal agencies that regulate GE agriculture: USDA-APHIS, EPA, and FDA. In their subsequent discussions, some task force members noted some concerns and gaps within the federal authorities. Some felt that the federal coordinated framework was not sufficiently coordinated, and left some key areas unattended. They felt the federal framework did not capture all of the key issues and concerns for Oregon. Others felt that the regulatory framework was as strong as it needed to be, particularly in the arena of FDA and food labeling. Concerns about coordination led to general questions about where authority lies, and whether some areas are even covered by a particular federal authority. For example, the burden of responsibility to address economic challenges with coexistence after deregulation of GE crops by USDA-APHIS is unclear and cumulative environmental impacts do not fall squarely in the authority of any federal agency. Additionally, members expressed concerns about crops that are not regulated because they fall outside of technical mechanisms described in current regulations, such as grasses developed through gene gun technology. Some pointed out that USDA has prepared Environmental Impact Statements (EIS's) in accordance with the National Environmental Policy Act (NEPA) on some recent GE products and they require consideration of broad ecological and economic impacts from deregulation decisions. Others noted that federal agencies are not required to conduct full EIS's for all new crops, and suggest that NEPA is primarily focused on disclosing impacts, not requiring their mitigation or the prevention of impacts.

### **Potential Conflicts between State and Federal Authorities**

As the task force considered gaps and uncertainties at the state and federal level, they also identified potential conflicts between state and federal authorities. Many felt that the pace of federal regulatory and legal changes does not move quickly enough to keep up with state policy development and new science. Others were concerned that if Oregon moves too quickly on these issues, it will get too far out in front of federal regulation and invite potential conflict. Others saw the state as more likely to consider state specific impacts and solutions than the federal agencies. The conversation raised the question of who leads on GE policy at the nexus of federal and state authority and action. Where can the state act to address issues, concerns and gaps, and where is it preempted by federal law? The task force did not find resolution on these issues; rather they raised them as potential conflicts to be considered by policymakers.

### **Legal Topics**

A number of legal issues arose in the task force's consideration of federal and state policy issues, most of which fall into the category of potential issues. Some noted that the legal environment on GE issues is a fragmented system of regulations and case law and is constantly evolving. For example, the recent POM Wonderful v. Coca Cola Supreme Court decision<sup>36</sup> opened the door for competitors to sue each other, even if they are in compliance with FDA regulations on labeling. The recent Vermont food labeling law is also being litigated and may have future impacts on these issues. Additionally, recent developments on country of origin labeling (COOL) further demonstrate the dynamic nature of the legal landscape<sup>37,38</sup>.

The task force recognized that it does not have the expertise or information to address potential legal issues related to regulation around GE, including interstate commerce, antitrust law, and questions of constitutionality, though each of those issues was raised as a potential consideration for policymakers.

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<sup>36</sup> POM Wonderful LLC v. The Coca Cola Company (2014) [http://www.supremecourt.gov/opinions/13pdf/12-761\\_6k47.pdf](http://www.supremecourt.gov/opinions/13pdf/12-761_6k47.pdf)

<sup>37</sup> American Meat Institute v. USDA (2014) [http://www.cadc.uscourts.gov/internet/opinions.nsf/A064A3175BC6DEEE85257D24004FA93B/\\$file/13-5281-1504951.pdf](http://www.cadc.uscourts.gov/internet/opinions.nsf/A064A3175BC6DEEE85257D24004FA93B/$file/13-5281-1504951.pdf)

<sup>38</sup> WTO ruling on COOL (2014) [http://www.wto.org/english/tratop\\_e/dispu\\_e/cases\\_e/ds384\\_e.htm](http://www.wto.org/english/tratop_e/dispu_e/cases_e/ds384_e.htm)

## Additional Policy Topics

Apart from state, federal, and legal issues, a few other policy topics were of note to task force members. Some task force members wished for acknowledgment of off-farm impacts to other stakeholders in the food system (e.g. putative butterfly-milkweed impacts of Roundup; cities) and were concerned about their role in decision-making about GE issues. Similarly, some consider it a gap that social and equity issues are not addressed sufficiently through the current regulatory system. This raised a broader question about the role and responsibility of government, and where its role is compared with other actors such as the marketplace. Task force members expressed varied opinions on the topic, with some seeing a clear role for government and others seeing a stronger role for the marketplace. Many noted that free enterprise is both an opportunity and a constraint in this situation. Task force members also raised questions about the influence of politics on GE related topics.

## Appendices

### Appendix A. Background and Status of GE Crops in Oregon

#### Background and Context

It is helpful for readers to know the context in which the task force did its work, as this is not the first time that Oregon has grappled with GE issues. In 2002, an initiative (Oregon Ballot Measure 27<sup>39</sup>) would have required labeling of GMO food sold in Oregon. The measure failed 70.5% to 29.5%. In the early 2000's, through administrative rule, Oregon established a GE bentgrass control area to prohibit its cultivation in the Willamette Valley and restrict bentgrass growing in central Oregon. In 2013, the Oregon Department of Agriculture adopted a rule allowing canola production (including GE canola) in a previously restricted control area in the Willamette Valley. ODA was sued, and eventually legislation (HB 2427<sup>40</sup>) overturned the rule. In 2014, Oregon's Jackson<sup>41</sup> and Josephine<sup>42</sup> counties passed initiatives to ban the growing of GE crops in their counties. Currently, there is a statewide GMO labeling initiative (Oregon Ballot Measure 92<sup>43</sup>) that will go to the ballot in November 2014.

In one of its first meetings, the taskforce received a briefing from ODA on the current status of GE crops in Oregon, a summary of which is provided here.

#### Overview of Status of GEs in Oregon

Nationally, both GE and organic crop practices have increased significantly over the past decade. Many of the statistics on GE crop use in the United States are not available for Oregon. For example, among the most common GE crops (corn, cotton, and soybeans) 90% of cultivation is GE but these crops are not widely grown (and in some cases, not grown at all) in Oregon and no statistics are available for GE crop use in this state. GE alternatives are not currently available for most agricultural commodities produced in Oregon. The primary GE crops grown in Oregon are sugar beets, alfalfa, canola, and corn.

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<sup>39</sup> Oregon Measure 27 (2002) [http://ballotpedia.org/Oregon\\_Labeling\\_of\\_Genetically-Engineered\\_Foods,\\_Measure\\_27\\_\(2002\)](http://ballotpedia.org/Oregon_Labeling_of_Genetically-Engineered_Foods,_Measure_27_(2002))

<sup>40</sup> Oregon HB 3427 <https://olis.leg.state.or.us/liz/2013R1/Measures/Text/HB2427/Enrolled>

<sup>41</sup> Jackson County Measure 15-119 (2014).

[http://ballotpedia.org/Jackson\\_County\\_Genetically\\_Modified\\_Organism\\_Ban,\\_Measure\\_15-119\\_\(May\\_2014\)](http://ballotpedia.org/Jackson_County_Genetically_Modified_Organism_Ban,_Measure_15-119_(May_2014))

<sup>42</sup> Josephine County Measure 17-58 (2014). <http://www.co.josephine.or.us/files/17-58ballotitlewebsite.pdf>

<sup>43</sup> Oregon Measure 92 (2014).

[http://ballotpedia.org/Oregon\\_Mandatory\\_Labeling\\_of\\_GMOs\\_Initiative,\\_Measure\\_92\\_\(2014\)](http://ballotpedia.org/Oregon_Mandatory_Labeling_of_GMOs_Initiative,_Measure_92_(2014))

## Notifications on Regulated Events

The Oregon Department of Agriculture (ODA) receives notifications from the United States Department of Agriculture - Animal and Plant Health Inspection Service (APHIS) regarding proposed regulated GE crop trials in Oregon. Notifications are limited due to APHIS regulations to protect confidential business information. The notifications ODA receives include information such as the crop, the county, and the phenotype (herbicide-tolerant, insect-resistant, etc.). The notifications do not include the specific location of the crop trials. ODA reviews the notification relative to state law, specifically the potential for importation of pests and diseases depending on the origin of the experimental materials, and provides comments to APHIS.

## Appendix B. Current Regulatory Landscape

### State Authority: Oregon Department of Agriculture (ODA)

The Oregon Department of Agriculture (ODA) is Oregon's primary state agency overseeing GE issues. ODA has some authority to regulate GE use, outlined below.

#### *Existing ODA Authorities*

According to ODA, existing state authority over regulation of GE crops is limited. ODA has two categories of authority, primarily applying to regulated GE crops: control area authority and biopharmaceutical authority. ODA also administers some programs to support conventional, GE, and organic agriculture, including promotion, certification, and testing.

ODA interprets its current regulatory authorities as limited to GE crops that have not yet been deregulated by the USDA Animal Plant Health Inspection Service (APHIS). Once the federal government has deregulated a crop, the department no longer has the statutory authority to regulate that crop solely based on its GE characteristics. When APHIS deregulates a GE crop they specifically indicate that the crop is not a pest or disease—therefore ODA does not believe it has the ability to regulate that federally deregulated crop under its control area statutes.

#### Control Area Authority

ODA's control area authority<sup>44</sup> allows them to create control areas to combat plant menace issues. ODA has established one control area order for a federally regulated GE crop—bentgrass field trials in Jefferson County<sup>45</sup>—and has a number of other control areas for pests and diseases such as apple maggot and potato disease.

#### Biopharmaceutical Authority

ODA has joint authority with the Department of Human Services to review biopharmaceutical applications proposed to USDA APHIS, to conduct site inspections and monitoring, and to take enforcement action. ODA has adopted administrative rules for biopharmaceutical crops, though there have been no biopharmaceutical applications in Oregon to date.

#### Labeling Authority

ODA adopted the federal Food Code as the basis of its food safety program, and looks to FDA to take the lead. If FDA notifies them that there is a problem with the label of an Oregon product, ODA will assist with the recall effort and enforcement action. They do not

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<sup>44</sup> Oregon Revised Statute 570.405 <http://www.oregonlaws.org/ors/570.405>

<sup>45</sup> Oregon Control Areas and Quarantines  
<http://www.oregon.gov/ODA/programs/NurseryChristmasTree/Pages/Quarantines.aspx>

conduct tests of food products to verify the accuracy of the label. ODA's labeling action is connected to its in-store inspection program. The in-store inspection program prioritizes inspections based on risk, and, at this point, labels are considered low priority. To date ODA has not received requests or complaints about GE-related labeling and when taking action on label issues, ODA coordinates with federal agencies on enforcement.

#### *ODA Activities*

In addition to its formal authorities, ODA administers programs and activities to help reduce conflicts between GE and non-GE crops.

#### *Mapping*

ODA does not currently have the statutory authority to gather the cropping information that would be needed to map crops that could cross-pollinate, including GE and non-GE crop varieties of the same crop, or closely related non-GE crops. State law does not require farmers to report cropping information to ODA. In addition, state law currently does not distinguish between GE and non-GE crop varieties.

#### *Other Programs*

ODA administers programs and services including identity-preserved certification and testing of GE presence as a component of these certifications. ODA marketing and certification programs support local, organic, identity-preserved and sustainable agriculture through Specialty Crop Block Grants, Farm to School activities, marketing assistance, and a variety of fee-for-service inspections and certifications

## **Federal Authority**

Three federal agencies have regulatory authority over GE-related issues: the United States Environmental Protection Agency (USEPA), the United States Department of Agriculture Animal and Plant Health Inspection Service (APHIS), and the United States Food and Drug Administration (FDA). Representatives from these three federal agencies participated in a task force meeting to provide an overview of their authorities and activities and to answer questions. Brief synopses of their authority and activities are provided below.

### **United States Environmental Protection Agency (USEPA)**

EPA regulates GMOs that are pesticidal in nature (known as plant incorporated protectants, or PIPs). EPA's authority involves three major laws: Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA<sup>46</sup>), Federal Food, Drug, and Cosmetic Act (FD&C<sup>47</sup>) (both amended by the Food Quality Protection Action of 1996, or FQPA<sup>48</sup>), and the Endangered Species Act (ESA<sup>49</sup>). EPA reviews PIPs, looking at four types of data (product characterization, potential effects on human health, environmental effects, and insect resistance management) and eventually issues a registration if the PIP is approved. Registrations are time-limited and can range from experimental use permits to full commercial registrations. EPA also sets tolerances for residue in food. FDA enforces tolerances for most foods; for meat, poultry, and some egg products, USDA enforces tolerances.

### **United States Department of Agriculture Animal and Plant Health Inspection Service (USDA APHIS)**

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<sup>46</sup> FIFRA info page <http://www.epa.gov/agriculture/lfra.html>

<sup>47</sup> FD&C info page <http://www.fda.gov/regulatoryinformation/legislation/FederalFoodDrugandCosmeticActFDCA/default.htm>

<sup>48</sup> FQPA info page <http://www.epa.gov/pesticides/regulating/laws/fqpa/>

<sup>49</sup> ESA info page <http://www2.epa.gov/laws-regulations/summary-endangered-species-act>



APHIS regulates GE organisms under the Plant Protection Act. GE organisms are considered regulated articles if they meet 2 criteria: 1) the organism has been produced through recombinant DNA techniques and 2) there is a plant pest involved, either as the donor of the genetic material, the recipient of genetic materials, or the vector organism. Firms that wish to commercialize GE crops can petition APHIS for deregulated status after field-testing, and then APHIS assesses GE crops through a plant pest risk assessment and either an environmental assessment or an environmental impact statement. To date, APHIS has deregulated 105 GE crops representing 16 species. APHIS collaborates with states by providing applications for authorizations, such as notifications and permits, and providing opportunities for state officials to review and submit comments. Additionally, APHIS has a compliance program within its Biotechnology Regulatory Services division. APHIS has a separate investigation and enforcement group. APHIS does not monitor crops once they are deregulated.

### **United States Food and Drug Administration (FDA)**

FDA has authority to enforce compliance with the law, which obligates firms to only market safe and otherwise lawful food. FDA regulates the labeling of foods produced through GE under its general food labeling authority. In 1992 FDA issued a policy statement on GE foods<sup>50</sup>, which was reaffirmed in its testimony before congress in 2014<sup>51</sup>. The major mechanism that FDA uses relating to GE crops is a voluntary free market food safety consultation process. This process can help firms ensure they are meeting their legal obligations before a food product goes on the market. FDA issued draft guidance on voluntary labeling of GE in 2001 and expects that it may be finalized soon. Regarding pesticides in general, EPA evaluates their safety for use on food and establishes a tolerance for any pesticide chemical residues. FDA then enforces tolerance limits set by EPA, and can take action to protect public health if tolerance limits are exceeded. FDA does some pesticide monitoring on foods and has an enforcement and compliance wing.

### **Trade Considerations**

GE crops exist in a complex web of trade issues. These issues include highly variable trade restrictions, labeling on food imported to countries with labeling requirements, approval of GE crops in international markets and regulatory systems, crop trials, and international protocols that have been recently adopted but have not yet led to consistency.

## **Appendix C: Resources shared by task force members**

Click the following link to view the resources:

<http://www.oregon.gov/gov/GNRO/Documents/Resources%20Shared%20by%20GE%20Task%20Force%20Members.pdf>

## **Appendix D: Governor's Letter Regarding GE Task Force**

Click the following link to view the letter:

<http://www.oregon.gov/gov/GNRO/Documents/Governor%27s%20Letter%20on%20GE%20Agriculture%20Task%20Force.pdf>

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<sup>50</sup> FDA Statement of Policy – Foods Derived from New Plant Varieties (1992).

<http://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/Biotechnology/ucm096095.htm>

<sup>51</sup> <http://appropriations.house.gov/calendararchive/eventsingle.aspx?EventID=373227>  
(approximately 1 hour and 13 minutes into video)

## **Appendix E: Public Comments Submitted to the Task Force**

Click the following link to view the comments:

[http://www.oregon.gov/gov/GNRO/Documents/Comments%20submitted%20to%20GE%20Task%20Force%20\(updated%2012-1-2014\).pdf](http://www.oregon.gov/gov/GNRO/Documents/Comments%20submitted%20to%20GE%20Task%20Force%20(updated%2012-1-2014).pdf)