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Dear Secretary Vilsack,

The Center for Food Safety (CFS) appreciated the opportunity to participate in the Roundup Ready alfalfa stakeholders' forum held on December 20th of last year. Thank you for initiating this important dialogue.

Like you, we are eager to find a solution that equitably addresses the many issues involved in deciding on the applicants' petition for nonregulated status for Roundup Ready alfalfa (RRA). In our view, two criteria should be paramount: the decision must be firmly grounded in sound science; and the outcome should be one that best serves the interests of all our nation's farmers. CFS believes that these criteria are not in conflict, but rather mutually reinforcing. That is, only a scientifically sound decision can be in the best interests of American farmers.

Two of our major concerns with RRA deregulation are unintended gene flow from RRA to conventional and organic alfalfa, and the likelihood that introduction of RRA would worsen the ongoing epidemic of glyphosate-resistant weeds. ***Gene flow and resistant weeds have already caused substantial harm to thousands of American farmers***, and thus deserve careful analysis in the context of RRA.

Harms from gene flow

Alfalfa is a bee-pollinated, perennial plant, which makes transgenic contamination much more likely than it is with self-pollinating crops like rice or wind-pollinated crops like corn. Yet confinement efforts with these more easily contained crops have often failed, sometimes spectacularly. Conventional corn and rice growers suffered losses in the hundreds of millions of dollars from contamination episodes involving two genetically engineered (GE) crops: StarLink corn (2000/2001)ⁱ and LibertyLink rice (2006/2007).ⁱⁱ The organic canola industry in Canada was "destroyed" by pervasive transgenic contamination.ⁱⁱⁱ Two key similarities between canola and alfalfa – long-distance bee pollination and ubiquity of volunteers and feral plants – suggest a similar fate could befall conventional and organic alfalfa.

At present, Canada's entire \$320 million flax industry is threatened by GE contamination with a long de-registered variety that late in 2009 turned up unexpectedly in flax

shipments to the European Union, which has rejected them.^{iv} There have been over 200 transgenic contamination episodes documented over the past decade,^v many of which have triggered rejection of shipments by grain elevators or food companies. Conventional and organic growers undertake expensive and often unsuccessful “contamination prevention” efforts, and many also commission expensive testing of their supplies for the presence of unintended transgenic material.^{vi} Things have reached the point where grain dealers are “offshoring” organic production (e.g. organic seed corn) to foreign countries that are able to ensure production of uncontaminated product, costing American farmers jobs and income.^{vii}

We applaud USDA for recognizing the serious impacts transgenic contamination has on farmers and proposing measures to mitigate it. However, for any such initiative to be successful, it must have two essential elements. First, liability for financial losses incurred by farmers due to transgenic contamination would have to be assigned to the applicants. Second, the Department itself would need to oversee implementation and enforcement of the plan. Past experience demonstrates the need for these measures.

Without clear assignment of liability, the GE crop developer may try to avoid accountability. We note that Bayer CropScience (developer of LibertyLink rice) denied any culpability for the contamination episode noted above that caused such huge losses to American rice farmers, and instead blamed “unavoidable circumstances which could not have been prevented by anyone”; “an act of God”; and farmers’ “own negligence, carelessness, and/or comparative fault.”^{viii} In this light, it is troubling that co-applicant Forage Genetics has a history of refusing to inform conventional growers of the locations of RR alfalfa fields.^{ix}

The Department would have to oversee implementation and enforcement of these plans because the applicants’ conflict of interest disqualifies them for the task. Recall that the Environmental Protection Agency (EPA) delegated stewardship responsibilities for GE StarLink corn to Aventis CropScience, its developer, much as USDA proposes to let Monsanto-Forage Genetics (FGI) implement and enforce RRA stewardship via contracts or licenses with growers.^x Aventis misbranded some StarLink seed bags by not including required planting restrictions. Iowa attorney general Tom Miller suggested that Aventis failed to inform many farmers of restrictions on growing StarLink for fear of losing them as customers.^{xi} The result was a huge and costly contamination debacle for American farmers. Monsanto and FGI would be in a similar conflict of interest situation – reluctant to enforce contractual stewardship obligations for fear of losing customers disinclined to fulfill them.

Monsanto recently provided an illustration of how conflict of interest operates to undermine compliance with stewardship obligations. In the summer of 2010, EPA fined Monsanto \$2.5 million for distributing misbranded GE insect-resistant cotton seed.^{xii} Due to Monsanto’s failure to include in Grower Guides EPA-ordered language prohibiting commercial planting of the cotton seed in 10 Texas counties, the seed was widely sold and planted in those counties from 2002 to 2007. The planting restrictions were part of EPA’s program to forestall evolution of insect resistance to GE insect-resistant crops (no comparable program exists for herbicide-resistant weeds fostered by RR crop systems).

Monsanto clearly profited from its violation of EPA rules, gaining substantial revenue from illegal seed sales over a six-year period. Monsanto and FGI would likewise profit if they were to maximize sale of RR alfalfa seed by violating the terms of any coexistence stewardship agreement they have with USDA.

Harms from glyphosate-resistant weeds and increased herbicide use

CFS is also greatly concerned that RR alfalfa would exacerbate the ongoing epidemic of glyphosate-resistant weeds, which have emerged over the past decade in response to massive use of glyphosate with Roundup Ready soybeans, cotton and corn.^{xiii} Glyphosate-resistant (GR) weeds presently infest over 10 million acres of U.S. cropland,^{xiv} with projections of 38 million acres, or one in every four row crop acres, by 2013.^{xv} The many costs imposed by RR crop systems via evolution of GR weeds include increased pesticide pollution of the environment, increased soil erosion from tillage, and reduced farmer income from increased weed control costs.

Roundup Ready crops have led to use of 383 million lbs. more herbicide than would have been applied in their absence over the 13 years from 1996 to 2008.^{xvi} One important reason for this is the widespread evolution of glyphosate-resistant weeds they have fostered. According to the National Academy of Sciences, farmers respond to glyphosate-resistant weeds by “...increasing the magnitude and frequency of glyphosate applications, using other herbicides in addition to glyphosate, or increasing their use of tillage.”^{xvii} Pesticidal responses to these resistant weeds include toxic arsenic-based herbicides^{xviii} and increased use of 2,4-D, the dioxin-laced component of the Vietnam War defoliant, Agent Orange.^{xix} Many farmers afflicted with GR horseweed have resorted to tillage to remove them, abandoning their no-till regimes and in the process increasing soil erosion.^{xx} In 2009 in Georgia, **half a million acres of cotton were weeded by hand**, at a cost of \$11 million, to remove noxious, glyphosate-resistant pigweed, increasing per acre weed control costs from \$25 to \$60-100 per acre.^{xxi} The Midwest is also seriously impacted. Noxious tall waterhemp (*Amaranthus tuberculatus*) resistant to glyphosate and two to three other classes of herbicides is spreading throughout the Corn Belt. Weed scientists in Illinois warn that it is poised to become an “unmanageable” problem that could soon make it impractical to grow soybeans in some Midwestern fields.^{xxii}

The replacement of conventional alfalfa with Roundup Ready alfalfa in rotations already dominated by Roundup Ready corn (70% of national acreage) and RR soybeans (93% of national acreage) would sharply increase glyphosate selection pressure and spur glyphosate-resistant weeds to evolve still more rapidly,^{xxiii} as even supporters of RR alfalfa concede,^{xxiv} exacerbating the many harms noted above. And to what end?

RR alfalfa provides very little countervailing benefit, because alfalfa is a crop that simply does not require weed-killing chemicals. It grows vigorously in dense stands that crowd out weeds, and regular mowing effectively controls those that do emerge. This explains why just 7% of alfalfa hay acres in the U.S. are treated with any herbicide at all,^{xxv} and why **USDA projects that substantial adoption of herbicide-promoting RR alfalfa would increase herbicide use by up to 23 million lbs. per year.**^{xxvi} This increased herbicide use would bring little benefit, as even USDA concedes that neither the quality nor the yield of

RR alfalfa hay has been demonstrated to be systematically better than that of conventional alfalfa.^{xxvii}

Glyphosate-resistant weeds are increasing weed control costs substantially, and in severe cases threaten to put farmers out of business^{xxviii} – farmers who for many years have been misguided by Monsanto into believing that Roundup Ready crops can be grown and sprayed with glyphosate year-in, year-out, without risk of weed resistance.^{xxix}

Need for science “of the highest integrity”

This brief overview demonstrates that transgene flow and glyphosate-resistant weeds have grave implications for American farmers, including alfalfa growers. Such serious issues must be addressed with science “of the highest integrity,” consistent with the Obama Administration’s recent memorandum demanding as much from all executive departments and agencies in their scientific policymaking.^{xxx}

USDA’s Animal and Plant Health Inspection Service (APHIS) prepared a final environmental impact statement (FEIS) to serve as the basis for deciding on the status of Roundup Ready alfalfa. Three alternatives were proposed. Alternative 1 would allow cultivation of RRA only via permit from APHIS; Alternative 2 would allow planting of RRA with no restriction or oversight. Alternative 3 would allow RRA to be grown subject to certain geographic restrictions and isolation measures.^{xxxi}

While the FEIS represents a welcome first step in several respects, it unfortunately fails to meet the high standards of scientific integrity demanded by the President and his Office of Science and Technology Policy (OSTP). We briefly describe a few of the many deficiencies in the FEIS below.

- * **Co-plaintiffs are conventional growers:** APHIS mistakenly classifies co-plaintiff farmers as “organic,”^{xxxii} when in fact Phil Geertson and Pat Trask are conventional alfalfa growers. This error underscores a larger theme: RRA is not just an “organic vs. biotech” issue. Conventional alfalfa growers are equally concerned about the threat of RRA contamination.
- * **Contamination “target” unjustified:** APHIS tacitly endorses co-applicant Forage Genetics’ “target” of 0.5% for maximum transgenic contamination of conventional/organic alfalfa^{xxxiii} as the basis for “co-existence,” despite the fact that far lower levels of contamination are easily detectable and would inevitably result in substantial loss of markets for conventional alfalfa growers.^{xxxiv}
- * **Hay-to-seed contamination a certainty:** In its Alfalfa Seed Stewardship Program, the Association of Official Seed Certifying Agencies (AOSCA) has established 2 miles (10,560 feet) as the distance required to prevent gene flow from RR alfalfa **hay** to conventional **seed** fields.^{xxxv} APHIS’s proposal (for Tier II states with lesser alfalfa seed production) to allow planting of RR alfalfa hay within 165 feet of a conventional seed field if the former is harvested at or before 10% bloom^{xxxvi} is scientifically unjustified and unworkable in the real world. Farmers often harvest after 10% bloom for reasons beyond their control,^{xxxvii}

meaning substantial pollen production to cross-pollinate a neighboring seed field. APHIS provides no explanation for choosing this unprotective standard rather than the AOSCA-recommended 2 miles.^{xxxviii}

* **Contaminated seed a long-term, costly problem for conventional growers:** APHIS ignores the long-term costs that would be imposed on conventional alfalfa growers by contamination of their seed with the Roundup Ready trait, including the substantial costs of increased and more toxic herbicide use for stand removal and control of weedy, volunteer Roundup Ready alfalfa in follow-on crops.

* **APHIS relies on obsolete data:** In numerous instances involving pesticide use, resistant weeds, and other matters, APHIS relies on misleading, obsolete data that obscure serious problems with Roundup Ready crop systems like RRA that more recent data would have revealed. APHIS persisted in these errors even after being alerted to them in CFS comments on the draft EIS.^{xxxix} Here, APHIS certainly did not rely on information “of the highest integrity,” as required by Dr. Holdren, director of the White House Office of Science and Technology Policy.

* **APHIS relies on politically motivated misinformation:** APHIS has also relied heavily on false “simulation” data and faulty analyses generated by entities with financial ties to the biotechnology industry – data and analyses that obscure negative impacts of RR crop systems like RRA and put these crops in a falsely positive light. Because APHIS has done this after being informed of the unreliable nature of the data it relied on,^{xl} it has allowed its analysis to be corrupted by “inappropriate political influence,” which violates another principle of the Obama Administration’s scientific integrity policy.

* **Incompetent analysis:** APHIS’s treatment of weed resistance lacks any competent, real-world assessment of how current RR crop systems (e.g. soybeans, cotton and corn) have triggered an epidemic of glyphosate-resistant weeds; of the many costs these weeds have imposed on farmers and the environment; or of RRA’s likely contribution to weed resistance should it be deregulated. The treatment also exhibits basic misunderstandings with respect to the forces involved in the evolution of herbicide-resistance in weeds, reflecting personnel who lack expertise in this area. As a result, the glyphosate-resistant weed risk posed by introduction of RRA is discounted and dismissed without scientific justification. Here, APHIS has violated the OSTP principle that scientific officers be selected “based primarily on their scientific and technological knowledge, credentials, experience, and integrity.”

* **APHIS misconstrues its statutory authority:** APHIS regulates GE crops under the Plant Protection Act (PPA), which as amended in 2000 incorporates the former Noxious Weed Act, the provisions of which give the Department broad powers to protect the interests of American agriculture from weeds that cause serious harm. In the FEIS, APHIS assiduously avoids any mention of its statutory, PPA-conferred authority to regulate GE organisms for “noxious weed risks” they may pose, even though RR crop systems like RRA have demonstrably generated harmful noxious weeds resistant to glyphosate herbicide.

These deficiencies in the FEIS, and many others like them, have resulted in a document that does not provide a scientifically sound foundation for a decision on the status of Roundup Ready alfalfa. Therefore, we respectfully request that USDA take appropriate steps to remedy the FEIS, and re-formulate and thoroughly re-consider the alternatives in light of the corrected analysis, before any decision is made on the Roundup Ready alfalfa petition for nonregulated status. This is an important and precedential decision, one that should not be rushed solely to meet the marketing timelines or sales targets of the applicants.

Center for Food Safety would like to thank you once again, Secretary Vilsack, for initiating the stakeholders' dialogue on Roundup Ready alfalfa. We look forward to working with you to achieve an outcome that is both scientifically sound and in the best interests of American farmers.

Sincerely,

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Bill Freese, Science Policy Analyst
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CC:

Phyllis Fong, Inspector General, United States Department of Agriculture
Nancy Sutley, Chair, White House Council on Environmental Quality
Lisa Jackson, Administrator, Environmental Protection Agency
Jim Jones, Deputy Assistant Administrator, Environmental Protection Agency
John P. Holdren, Director, White House Office of Science and Technology Policy
Patrick Leahy, U.S. Senate, United States Congress
Peter DeFazio, U.S. House of Representatives, United States Congress

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- i Arasu, K.T. (2003). "US farmers reach \$110 million StarLink settlement," Reuters, Feb. 7, 2003.
- ii Blue, E.N. (2007). "Risky Business: Economic and regulatory impacts from the unintended release of genetically engineered rice varieties into the rice merchandising system of the US," Neil Blue Consulting, for Greenpeace, Nov. 2007.
- iii Smyth et al (2002). "Liabilities and Economics of Transgenic Crops," *Nature Biotechnology*, June 2002: pp. 537-541: "[T]he introduction of transgenic herbicide-tolerant canola in Western Canada destroyed the growing, albeit limited, market for organic canola."
- iv CBC News (2010). "Triffid seed threatens flax industry," CBC Canada, Jan. 20, 2010.
<http://www.cbc.ca/canada/manitoba/story/2010/01/20/mb-flax-triffid-manitoba.html>
- v Greenpeace International (2008). "GM Contamination Register Report 2007," Feb. 28, 2008, at <http://www.greenpeace.org/international/press/reports/gm-contamination-register-2007>.
- vi See generally Warwick, H. & G. Meziani (2002). "Seeds of Doubt: North American Farmers' Experiences of GM Crops," Soil Association, U.K. 2002.
<http://www.soilassociation.org/LinkClick.aspx?fileticket=6lQJZLPalqo%3d&tabid=390>.
- vii CFNP (2003). "Testing Methodologies in Tracing, Segregating and Labeling Foods Derived from Modern Biotechnology: Proceedings," Center for Food and Nutrition Policy, Virginia Tech, Feb. 25, 2003, p. 54: Organic grain supplier Clarkson Grain Company of Cerro Gordo, Illinois, obtains organic seed corn from Argentina, where it is possible to isolate the seed field with a three-mile buffer zone. According to president Lynn Clarkson: I would be happy to do it in Illinois, Indiana, or Iowa, but I can't find that degree of segregation with any reliability."
- viii Weiss, R. (2006). "Firm blames farmers, 'act of God' for rice contamination," *The Washington Post*, Nov. 22, 2006. http://www.washingtonpost.com/wp-dyn/content/article/2006/11/21/AR2006112101265_pf.html
- ix Forage Genetics refused to divulge the locations of Roundup Ready alfalfa fields to conventional growers seeking the information to help them avoid contamination of their alfalfa seed fields in 2005 and 2006. Source: Personal communication, alfalfa seed grower Phil Geertson of Oregon.
- x USDA APHIS (2010). Final Environmental Impact Statement (FEIS) for Roundup Ready alfalfa (henceforth FEIS), at 13: "Under this alternative [3], the developer (marketer) of GT alfalfa would ensure that the end users are using the required management practices. They might do this through contracts or licenses, or by other means." http://www.aphis.usda.gov/biotechnology/downloads/alfalfa/gt_alfalfa%20_feis.pdf.
- xi Ryberg, W. (2000). "Growers of biotech corn say they weren't warned: StarLink tags appear to indicate it's suitable for human food products," *Des Moines Register*, 10/25/2000.
<http://www.gmfoodnews.com/dm251000.txt>. Excerpt: "Miller said the complicated restrictions associated with StarLink raise a common-sense question: Why would farmers buy the seed if they knew there were so many conditions attached to growing the crop? 'I just don't think if the restrictions were disclosed many farmers would have bought the grain,' Miller said."
- xii EPA (2010). "EPA fines Monsanto for distributing misbranded genetically engineered pesticide," Environmental Protection Agency press release, July 8, 2010.
<http://yosemite.epa.gov/opa/admpress.nsf/e77fdd4f5afd88a3852576b3005a604f/6754b55aaec2aee18525775a0061f90b!OpenDocument>
- xiii Service, R.F. (2007). "A growing threat down on the farm," *Science* 316: 1114-1117. Eminent weed scientist Dr. Stephen B. Powles is quoted as follows in this 2007 article: "There is going to be an epidemic of glyphosate-resistant weeds. In 3 to 4 years, it will be a major problem." The future is now.
- xiv "WSSA supports NRC Findings on Weed Control," *Weed Science Society of America*, 5/27/10. Weed scientist Dr. Ian Heap, who runs the International Survey of Herbicide-Resistant Weeds (www.weedscience.com), is cited for the statement that 6% of the total area planted to corn, soybean and cotton in the U.S. [which is 173 million acres] is infested with GR weeds.
<http://www.wssa.net/WSSA/Information/WSSA%20position%20paper%20on%20herbicide%20resistance%205-27-2010.pdf>
- xv FEIS, App. G at G-35. See also: Syngenta (2009). "Leading the Fight against Glyphosate Resistance," quoting Chuck Foresman, manager of weed resistance strategies.
<http://www.syngentaebiz.com/DotNetEBiz/ImageLibrary/WR%203%20Leading%20the%20Fight.pdf>

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- ^{xvi} Benbrook, C. (2009). Impacts of Genetically Engineered Crops on Pesticide Use in the United States: The First Thirteen Years," The Organic Center, November 2009. http://www.organic-center.org/science.pest.php?action=view&report_id=159.
- ^{xvii} NRC (2010). "The Impact of Genetically Engineered Crops on Farm Sustainability in the United States," National Research Council, National Academy of Sciences, 2010 (prepublication copy), p. 2-15.
- ^{xviii} EPA is in the process of phasing out arsenical herbicides, but made a special exemption for use on cotton to give cotton farmers another tool to battle the devastating glyphosate-resistant Palmer amaranth (pigweed). See: EPA (2009). "Amendment to Organic Arsenicals RED," Letter from EPA's Richard P. Keigwin, Jr., Director, Special Review and Reregistration Division, EPA, to Registrant, April 22, 2009.
- ^{xix} Benbrook (2009), op. cit., p. 59.
- ^{xx} Benbrook (2009), op. cit., pp. 38-39.
- ^{xxi} Haire, B. (2010). "Pigweed threatens Georgia cotton industry," Southeast Farm Press, July 6, 2010. <http://southeastfarmpress.com/pigweed-threatens-georgia-cotton-industry>.
- ^{xxii} Tranel, P.J. et al (2010). "Herbicide resistances in *Amaranthus tuberculatus*: A call for new options," Journal of Agricultural and Food Chemistry, DOI:10.1021/jf103797n: "Herbicide resistance in *A. tuberculatus* **appears to be on the threshold of becoming an unmanageable problem in soybean.**" "Furthermore, on the basis of *A. tuberculatus*'s history, there is no reason to expect it will not evolve resistance to glufosinate if this herbicide is widely used. If this happens, and no new soybean postemergence herbicides are commercialized, **soybean production may not be practical in many Midwest U.S. fields.**" (emphasis added)
- ^{xxiii} NRC (2010), op. cit., pp. 2-19, 2-20. In a section entitled "Developing weed management strategies for herbicide-resistant crops," the NRC stated: "As for using crop rotations, the increasingly common practice of farmers throughout the United States of using glyphosate as the primary or only weed-management tactic in rotations of different glyphosate-resistant crops limits the application of the rotation strategy..."
- ^{xxiv} Orloff, S.B. et al (2009). "Avoiding weed shifts and weed resistance in Roundup Ready alfalfa systems," University of California, Publication 8362, February 2009: "The effectiveness of crop rotation to manage weed shifts and resistance is substantially reduced if another RR crop (such as corn or cotton) is planted in rotation with RR alfalfa, since the same herbicide and selection pressure would likely occur." This is concerning especially given the increasingly difficult task of finding high quality corn and especially soybean seeds that do not contain the Roundup Ready trait. Orloff et al also make the following observation: "The cost of RR alfalfa seed is generally twice or more than that of conventional alfalfa seed. Naturally, growers will want to recoup their investment as quickly as possible. Therefore, **considerable economic incentive exists for the producer to rely solely on repeated glyphosate applications alone as a weed control program.** ... While relying solely on glyphosate and shaving rates may provide satisfactory results in the short term, it is a risky practice in the long run as **it will accelerate weed species shifts and the evolution of resistant weeds.**" (emphasis added). These are astute observations on the powerful forces that drive growers of RR alfalfa to rely solely on glyphosate, and the certain result – more glyphosate-resistant weeds and weed shifts to more tolerant species. Unfortunately, the authors naively assume that their recommendations to forestall weed resistance – which involve more time and expense, for no obvious, immediate benefit – will be adopted by alfalfa growers. This flies in the face of all the evidence we have from farmers' use of other RR crop systems, where even today exclusive reliance on glyphosate is quite common wherever glyphosate-resistant weeds have not **yet** evolved, despite a huge body of extension recommendations and farm press articles urging farmers to adopt much the same measures promoted here by Orloff et al. While APHIS cites this paper for other reasons, it fails to discuss this part of it, or otherwise provide any meaningful discussion of how farmers use herbicides with RR crops in the real world.
- ^{xxv} USDA NASS (1999). "Agricultural Chemical Usage: 1998 Field Crops Summary," USDA National Agricultural Statistics Service, May 1999, p. 3: "Growers applied herbicides to 7 percent of their acres across the United States." See also pp. 6-12. <http://usda.mannlib.cornell.edu/usda/nass/AgriChemUsFC//1990s/1999/AgriChemUsFC-05-19-1999.pdf>
- ^{xxvi} FEIS, App. J at J-47, Table J-19.
- ^{xxvii} FEIS at 156, 157.
- ^{xxviii} Haire, B. (2010), op. cit., quoting University of Georgia weed scientist Stanley Culpepper: "We're talking survival, at least economically speaking, in some areas, because some growers aren't going to survive this."
- ^{xxix} Hartzler, B. (2004). "No benefit in rotating glyphosate," Weed Science, Iowa State University, Dec. 17, 2004. <http://www.weeds.iastate.edu/mgmt/2004/twoforone.shtml>.

^{xxx} OSTP (2010). “Memorandum for the Heads of Executive Departments and Agencies on Scientific Integrity,” from John P. Holdren, Director, Office of Science and Technology, Dec. 17, 2010.

^{xxxi} FEIS at 12-15.

^{xxxii} FEIS at ii, 4.

^{xxxiii} FEIS at 111.

^{xxxiv} FEIS, App. V at V-64, V-65.

^{xxxv} FEIS at 36. FEIS at 116 describes the two-mile isolation distance differently than FEIS at 35. At 116, APHIS says the two mile isolation distance is AOSCA’s standard to prevent RR **hay**-to-conventional **hay** gene flow rather than RR **hay** to conventional **seed** gene flow. The Alfalfa Seed Stewardship Program which describes AOSCA’s RR alfalfa contamination prevention recommendations was not found at the AOSCA link cited by APHIS in the FEIS.

^{xxxvi} FEIS at 14.

^{xxxvii} FEIS, App. V at V-32.

^{xxxviii} FEIS at 36: 165 feet is the distance required for isolation of certified alfalfa seed fields of less than five acres from surrounding alfalfa of different varieties. This standard has no applicability to RR alfalfa, since it was designed to ensure adequate varietal purity in a world of conventional alfalfa seed, not the much higher degree of purity required when the contaminating variety is transgenic. AOSCA’s 2-mile isolation distance recognizes the demands for higher purity in the transgenic situation.

^{xxxix} CFS (2010). “Comments on the Draft Environmental Impact Statement for Deregulation of Roundup Ready Alfalfa,” by Bill Freese, Science Policy Analyst, Docket No. APHIS-2007-0044, Center for Food Safety, March 3, 2010. Note: CFS submitted legal and scientific comments separately; these are the science comments.

^{xl} CFS (2010), op. cit.