



March 4, 2004

Docket No. 03-101-1
Regulatory Analysis and Development, PPD
APHIS Station 3C71
4700 River Rd., Unit 118
Riverdale, MD 20737-1238

Filed in quadruplicate

Re: Docket No. 03-101-1, petition from Monsanto Co. and The Scotts Co. seeking a determination of nonregulated status for glyphosate-tolerant creeping bentgrass (*Agrostis stolonifera* L.)

Dear Sir/Madam:

Thank you for the opportunity to comment on the above-referenced docket. The International Center for Technology Assessment (CTA) and the Center for Food Safety (CFS) are non-profit, public interest, advocacy organizations. CTA is devoted to fully exploring the economic, ethical, social, environmental and political impacts that can result from the applications of technology. CFS, a membership group, was established to address the increasing concerns about the impacts of our crop production systems on human health, animal welfare and the environment. Together with the many active CFS members, we have diverse economic, recreational, health, conservation, and aesthetic interests that may be negatively impacted by the Monsanto/Scotts deregulation petition.

INTRODUCTION

This comment first address the defects in the petition submitted by Monsanto and Scotts and then addressees other evidence on environmental impact issues presented by the deregulation proposal. It concludes with reflections on the National Environmental Policy Act (NEPA) and Endangered Species Act (ESA) concerns raised. The comment includes discussion of the plant pest and weediness issues highlighted in APHIS's Notice, as well as other issues, with an emphasis on the point that the potentially significant impacts presented by the proposal mandate preparation of a full Environmental Impact Statement (EIS) under NEPA and a formal Sec. 7 consultation under the ESA, including preparation of a detailed Biological Opinion by the U.S. Fish and Wildlife Service.

We refer to and, by this reference, incorporate into this comment the arguments made on the GE variety at issue, glyphosate resistant creeping bentgrass, in our earlier Petition on Genetically Engineered Turfgrasses, including a Noxious Weed Listing Petition, filed with APHIS on July 18, 2002, and our supplemental evidence filed in support of that Petition, dated Apr. 21, 2003 (copies attached hereto, including attachments, except attachments that were specific to GE Kentucky bluegrass are excluded). (Note: the status of that Noxious Weed Listing Petition and the related

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ongoing Federal litigation over APHIS's response to it are provided in **Appendix 1**, attached hereto.) Rather than repeating all of the points in that Petition, this comment below will focus on supplementing them with new information. However, to set the context we reiterate the two key points made therein:

- GE glyphosate tolerant creeping bentgrass would be, in one expert's words, 'the first perennial (stoloniferous), wind pollinated, outcrossing transgenic to be grown adjacent to naturalized and native populations of cross-compatible perennial relatives and native species.' Significant gene flow will occur into its nontransgenic domesticated and wild relatives. In other words, unintended genetic contamination essentially will be guaranteed. The problem is that creeping bentgrass is a serious weed in many areas. Future unwanted spread of glyphosate resistant creeping bentgrass may result not only from pollen movement and gene flow into nearby related species, but also by way of seed transport to new areas and by vegetative spread.
- Deregulation also would enable the first ever commercial release of a recognized weed enhanced specifically to resist a leading weedkiller. This enhancement will make it - and the weedy relatives it outcrosses with - much more difficult to control, requiring more toxic weedkillers than glyphosate. This could prevent their control altogether in some places, such as in sensitive nature preserves that provide habitat for rare, State and Federally-listed endangered plant and animals.

DEFECTS IN THE MONSANTO/SCOTTS PETITION

Below we comment on the defects in the deregulation petition:

p. 26 - The applicants' stated intent to sell the deregulated product only to the golf course market is not enforceable. It is foreseeable that, if deregulated under the current APHIS approach, the product will be sold by retailers for a variety of uses. Past experience with GE StarLink corn and the low rates of farmer compliance for Bt corn resistance management "requirements" show clearly that company intent and alleged marketing restrictions will not be reliably followed at the ultimate user stage. Indeed, because of the various claimed benefits for the GE bentgrass, it is foreseeable that the product will be marketed and be attractive for other uses, such as in an estimated 40,000,000 residential lawns and parks, at least 40,000 athletic facilities, and countless other landscaping applications in every habitat type in every State. When a product is advertised, is observed, and becomes "hot," the manufacturer's assurances about limited marketing become meaningless.

The petition includes no commitment to monitoring or followup to determine compliance. One reason for the need for a full EIS (see discussion in NEPA Concerns section below) is to assess the

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alternative approach of attaching mitigating conditions including enforceable provisions limiting the use of the product to golf courses, imposing resistance management requirements to mitigate the development of Roundup resistant weeds, requiring monitoring, and so on.

pp. 26-27 - The petition acknowledges that resistant weeds could develop as a result of the product, but it fails to assess this quantitatively in terms of the foreseeable increase in the use of glyphosate after full market penetration by the product, and how this will foreseeably increase the incidence of resistant weeds developing. Further, it acknowledges that the product will displace other herbicides, without assessing this quantitatively in terms of how this will foreseeably increase incidences of applicator use and misuse of glyphosate. It is clear that a dramatic increase in glyphosate use and misuse is foreseeable.

Published epidemiological research has shown that applicator use and misuse of glyphosate has resulted in harm to human health (Box 1). This petition completely fails to address this foreseeable increased use and misuse by a relatively poorly educated, often non-English speaking, golf course labor force. This is a labor force with little experience in broadcast spraying of glyphosate, thus misuse is likely. While these are health impacts, they result from the foreseeable environmental impact of spray misapplication, thus under NEPA they must be assessed as effects of the action (see CEQ NEPA regulations, all-inclusive definition of “effects,” including health effects, 40 CFR § 1508.8).

BOX 1: Health Effects of Glyphosate

While glyphosate often is touted as safe, published documentation of its toxicity must be considered. Attached as Tab 11 to the supplement to the CTA/CFS Noxious Weed Listing Petition is a paper by V.F. Garry, et al., entitled “Birth defects, season of conception, and sex of children born to pesticide applicators living in the Red River Valley of Minnesota, USA” from *Environmental Health Perspectives*, June 3, 2002, vol. 110 supp. (the National Institute of Health’s peer-reviewed environmental health journal). This key epidemiological study shows a link between glyphosate use and neurobehavioral birth defects in the offspring of farmers who apply it. The paper states (p. 445):

No other commonly used pesticide [besides glyphosate and phosphine, a fumigant] compared by major organ and/or functional system was uniquely associated with specific adverse birth or developmental effects.

The paper’s findings are labeled “tentative,” but the authors conclude (p. 447), “Further detailed neurodevelopmental studies are required to resolve these issues.” Further, attached as Tab 12 is a paper by L.P. Walsh et al., entitled, “Roundup inhibits steroidogenesis by disrupting steroidogenic acute regulatory protein expression” from *Environmental Health Perspectives*, Aug., 2000, vol. 108.

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This *in vitro* study showed that glyphosate inhibits certain hormones involved in human reproduction. Another paper reportedly showed that glyphosate exposure nearly doubled the risk of late spontaneous abortion in Ontario farm populations. (Arbuckel, T., et al. 2001. An exploratory analysis of the effect of pesticide exposure on the risk of spontaneous abortion in an Ontario farm population. *Environmental Health Perspectives* 109: 851-60.)

APHIS should consider this and other health information on glyphosate as it assesses the potential impacts posed by these species. Until such time as such studies are completed, glyphosate resistant crops, such as turfgrasses, that would plainly lead to major increases in the use and misuse of the compound nationwide (indeed, worldwide) should be considered potential threats to human health. This is particularly the case for the millions of golf course workers, golf course neighbors, and of course golfers themselves involved here.

p. 28 - The petition is misleading in predicting an environmental benefit for reduction of methyl bromide due to the proposed creeping bentgrass product when under the 1987 Montreal Protocol on reducing pollution from chlorofluorocarbons and other ozone-depleting substances, the U.S. already is committed to promptly phasing that chemical out of production (see J.C. Neal, 2000, paper discussed below, Appendix 5, at p. 7). The phaseout will happen prior to any foreseeable broad commercialization of the proposed product.

p. 44 - The petition should identify specifically which six States identify *Agrostis* seeds as noxious and/or undesirable. The petition fails to note the classification of *A. stolonifera* on several expert-developed lists of non-native weeds. The Plant Conservation Alliance, a consortium of ten Federal agencies and 145 non-Federal cooperators, lists it as an alien plant invader of natural areas.¹ That list is on a website hosted by the National Park Service (NPS) and the NPS contributed data in support of the listing, indicating that agency scientists consider it as an invasive weed in one or more national parks. Also, the preeminent scientific society in this field, the Weed Science Society of America (WSSA), classifies it as a weed.² Similarly, the Pacific Northwest Exotic Pest Plant Council lists *A. stolonifera* as “most invasive - regional (highly to moderately invasive but still with a potential to spread)”.³ Indeed, Monsanto’s own website lists bentgrass (*A. Spp.*) as a weed that

¹ Website at www.nps.gov/plants/alien/list/a.htm .

² Website at www.wssa.net under “Weed Information” and “Plant Names”.

³ Website at www.wnps.org/eppclist.html .

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Roundup is formulated to control.⁴ Little doubt exists that scientists broadly recognize the species as a potentially serious weed.

p. 51 - The petition cites the Quemada (1999) report commissioned by APHIS, which asserted that cultivated grasses are weak competitors in unmanaged environments. The findings of this report are largely discredited as it failed to acknowledge the widespread presence of creeping bentgrass (and other turfgrasses) in unmanaged systems; see Appendix B to the attached CTA/CFS Noxious Weed Listing Petition; the Jordan and Randall, Nature Conservancy (TNC) report documenting the occurrence of creeping bentgrass as an invader in at least 18 distinct North American habitat types, i.e., boreal forest, riparian sedge, open canopy woodlands, shrublands, shrub-steppe, rare calcerous fens, rare native grasslands and prairies, moist meadows, swamps, coastal marshes, dunes, shorelines, swales, ditches, pastures, urban streets and vacant lots. This documentation includes both reliable personal communications from TNC managers and scientists and published weed literature.

Also, the Monsanto/Scotts petition is incorrect in characterizing the Quemada study's contributors as a "diverse group." The group was dominated by industry and agency scientists, with no apparent wildland weed expertise.

p. 52 - The petition is faulty in stating that herbicides are unlikely to be used on *Agrostis* species. TNC preserve managers and other land stewards use glyphosate as a critical tool to control invasive turfgrasses where feasible in these sensitive habitats; it is considered better than other herbicides as it less damaging (J. Randall, TNC, pers. comm.). This is particularly the case in moist areas and wetlands. Others have stated glyphosate is a "superior" herbicide for creeping bentgrass and that "no effective alternative herbicides are presently available."⁵ Clearly it is broadly used in parks and natural areas.

p. 56 - The petition's description in F.1. of what qualifies as a weed is not the test APHIS is to use under the Plant Protection Act, which is the statutory authority under which this GE plant proposal is being evaluated. Indeed the issue is whether it constitutes a "plant pest," which is defined expansively. In particular, the petition's assertion that in order for a colonizer of nonagricultural habitats to be classified as a weed, such habitats must be "possessing **exceptional** value to society and the environment" is wrong. Petitioners are proposing a very high threshold and have phrased the standard in a barely sensible way; what does it mean to "possess value" to "the environment"? Other nonagricultural habitats that may not be "exceptional" also deserve recognition when APHIS

⁴ Website at www.roundup.com/weeds/allweeds.html ; the species also was listed as a target weeds on the Roundup label, online at www.farmsource.com/Labels/RUPOrig_CG.pdf .

⁵ Hearing Officer's Report, In the matter of proposed rulemaking hearing: bentgrass control area in Jefferson County. Oregon Dept. of Agric., Jan. 18, 2002, p. 3.

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considers whether a proposed weedy product would degrade them.

p. 58 - Again the petition grossly understates the extent to which *A. stolonifera* has been classified as an important weed by the NPS, WSSA, TNC, et al.

p. 59 - The statement of the most common scenario for *A. stolonifera* migrating off of putting greens into surrounding grasses and then contaminating them doesn't fit with the assertion in other parts of the petition (e.g., p. 26) that the GE *A. stolonifera* also would be used for "tees and fairways". It is in the longer grass rough areas next to golf course greens, tees, and fairways, that the further spread of the resistance trait to neighboring residential, commercial, and natural areas begins, either as *A. stolonifera* that has not been cut short enough to stop pollen production and/or as one of its many weedy relatives with which it may hybridize. If the neighbor landowners attempt to control the invading variety with the common herbicide glyphosate, their efforts will fail (as they won't know it is glyphosate resistant; and there will be a significant time lag) and it will then have time to invade further. (See Affidavit of Joseph Cummins, Appendix 3, below.)

pp. 60 and 63 - The petition is misleading in its discounting of *A. stolonifera* as a natural area weed. The TNC report mentioned above made very clear that it is invasive in at least 14 natural habitat types and 4 human-built habitat types, which also must be considered. The assertions implying that it has only caused serious problems on one sub-Antarctic island and only invades in moist meadows and early succession forests are wrong.

pp. 147, 183, 201, 207, 220, et seq. - The conclusions from the field studies with respect to virtually every character studied were that no difference was observed in the field tests "compared to commercial creeping bentgrass cultivars" and that no "increased weed potential" is expected based on these results. But, this is not the relevant test. The threshold for requiring an EIS or ESA Sec. 7 compliance is whether foreseeable direct and indirect results of the new products' commercialization could pose "potentially significant impacts" (NEPA) or "may affect" threatened or endangered species or their critical habitats (ESA), when viewed independently, not comparatively. Again, if the product is as good in some respects as the applicants claim, it will foreseeably broaden the market for creeping bentgrass in golf courses and elsewhere, with a cumulative result of far greater acreage planted to creeping bentgrass. It is these additional direct and indirect impacts - examined both independently and cumulatively - that must be assessed, not just whether the new regulated product is better or worse than the old unregulated products.

p. 261- The petition concludes that hybridization will occur at distances up to 354 meters from the source and essentially admits that hybridization will be substantial within 50 meters. However, it fails to adequately acknowledge and compare the results of the Wipff and Fricker report (Appendix D to the attached CTA/CFS Noxious Weed Listing Petition), which shows in great detail that planting GE bentgrass can cause the spread of GE pollen to distances further than 1,300 meters. The

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bulk of the petition fails to indicate how hybridization events and gene flow - whether within 50 or 350 or 1,300 meters from a golf course - can be reduced or mitigated.

The suggestion, at the bottom of p. 261, that alternative methods are available to control the resulting spread of Roundup Ready grasses (of several outcrossing species), i.e., by “physical methods or the use of non-glyphosate based herbicides such as fluazifop, sethoxydim and clethodim.” As Monsanto and Scotts are very familiar (indeed both businesses are built on non-physical methods), physical methods are prohibitively time and labor intensive in many settings of advanced invasions. Further, the alternative herbicides pose various problems of increased toxicity, unsuitability for riparian areas and wetlands and other sensitive habitat types, and lack of labeling for use on creeping bentgrass.

pp. 272-77 - Again, it needs emphasis: **Monsanto’s and Scotts’ statements about stewardship intentions are voluntary and therefore should not be taken into account when considering foreseeable environmental impacts of the products.** Failing to learn the lessons of the StarLink disaster and the weak implementation of resistance management requirements for EPA-regulated Bt crops could foreseeably lead to what one commenter has called a “StarLink times ten” disaster of turfgrass contamination.

p. 288 - In view of all the evidence presented in the CTA/CFS Petition and the supplement thereto, the other comments submitted by knowledgeable scientists on this docket, and the other points made in this CTA/CFS comment, the Monsanto/Scotts assertion that they know of no foreseeable “adverse consequences of introduction” is remarkable and unreliable.

But, even if it were true, the petition fails to examine one fundamental environmental impact question, which is: what would be the economic impacts that would flow from the turfgrass seed contamination associated with broad commercialization of the GE bentgrass? Inevitably, contamination of non-GE turfgrass seed supplies will occur. (See the Union of Concerned Scientists report, *Gone to Seed - Transgenic Contaminants in the Traditional Seed Supply*, issued Feb. 23, 2004; online at: www.ucsusa.org/food_and_environment/biotechnology/seed_index.html .) Numerous foreign markets are closed to GE products. Some export markets for non-GE turfgrass companies will be eliminated, which will have a substantial impact in Oregon in particular, the leading turfgrass seed exporting State. Any environmental impact assessment must consider the effects of seed contamination.

As support for this trade impact assertion, attached as **Appendix 2** is a personal communication from Jack Crow, the Biosecurity Manager, Auckland Regional Council, New Zealand. He condemns the Monsanto/Scotts in several respects, colorfully stating that:

“It is predicted that most or all regulatory bodies in New Zealand will strenuously oppose the importation of any modified form of *Agrostis stolonifera*, which is already a well known weed of damp ground, boggy sites, disturbed ground, native grassland,

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introduced pasture (particularly of low-medium fertility) and open shrubland. It is also a nuisance sp in some turf situations, so a 'Roundup-ready' form would be a damn curse."

He also predicts that other countries besides New Zealand where the weed exists will ban imports of the Roundup Ready form. These bans will extend to other varieties that have been contaminated with the GE form, as has been the case with several incidents of GE contamination of food crops, notably the StarLink episode. This sort of "real world" impact of closed markets to U.S. products cannot be ignored.

In summary, the Monsanto/Scotts petition appears inadequate in many respects. Rather than proceed directly to the stage of NEPA compliance, we submit APHIS should deny the deregulation petition until such time as the problems identified by our comment, as well as surely by other comments in this docket, are remedied.

OTHER EVIDENCE ON ENVIRONMENTAL IMPACTS PRESENTED BY THE PETITION

Appendix 3. Cummins Affidavit

For further input on this issues, ICTA/CFS retained an expert consultant, Joseph Cummins, an Emeritus Professor of Genetics at the University of Western Ontario, Canada. He has broadly recognized expertise in plant genetics and in genetic engineering, and long professional experience addressing weed science issues presented by GE crops. His affidavit is attached. His key points, addressing first the APHIS denial of the CTA/CFS Noxious Weed Listing Petition for GE glyphosate tolerant creeping bentgrass are (pp. 1-3):

- "Initially, I find that the determination by APHIS to reject the International Center for Technology Assessment (ICTA) and Center for Food Safety (CFS) petition to list this GE turfgrass species as a noxious weed is not based on 'sound science'. The APHIS Administrative Record for this decision provided to me is devoid of any scientific citations or information of any kind that directly support the APHIS determination. In fact, the Record is completely dominated by well-documented and convincing scientific information that supports the ICTA/CFS noxious weed petition. I found the APHIS written opinions in this matter to lack any scientific backing and to lack any response to the detailed science submitted in support of the ICTA/CFS petition."

- "1) 'invasiveness' is only one of several characteristics that can cause a novel plant variety to be a weed; all characteristics must be taken into account, particularly the long term capacity to cause ecological and economic mischief that is present with these varieties, and 2) of course making a known, already invasive, weedy species - as we have

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here - able to resist and survive spraying by the most popular weed killer (herbicide) in North America (glyphosate, or Roundup) is likely to make this species even more invasive in the real world. As farmers, nature preserver managers, landscapers and homeowners - who generally won't know the GE turfgrass from non-GE grass as they would look the same - try to use glyphosate on the GE glyphosate tolerant variety, it won't work! Thus, the GE glyphosate resistant variety is more likely to stay put where it's not wanted and continue to spread and be more invasive by any common-sense definition. Further, the GE glyphosate resistant variety of creeping bentgrass has numerous already weedy relatives in North America with whom it easily and frequently will interbreed (hybridize). The numerous resulting hybrid plants will as a result have the glyphosate resistance trait themselves and they will be worse environmental and economic weeds too. Again, this is because managers who try to kill them with the most common herbicide won't know until it's too late that their spraying was a wasted effort. In the meantime the hybrid weeds will have invaded more of the nearby areas."

Dr. Cummins also states that genetically engineered glyphosate tolerant creeping bentgrass is "fundamentally biologically dissimilar" from its parent species and from any naturally selected glyphosate tolerant varieties, as the engineered characteristics will increase the potential risk of multiple herbicide-resistance traits developing and the risk of allergic reactions developing in humans exposed to it (p. 6). These are potentially significant future impacts of broad commercialization that the Monsanto/Scotts petition failed to adequately assess.

Appendix 4. USGS Report Excerpt

A recent report published by the U.S. Geological Survey documents nonnative plants in Sequoia-Kings Canyon and Yosemite National Parks, and provides a useful template for ranking alien species problems for management actions in these and other parks and reserves. The report is titled "Alien Plant Species Threat Assessment and Management Prioritization for Sequoia-Kings Canyon and Yosemite National Parks," by J.D. Gerlach, Jr., et al. (U.S. Geological Survey Open-File Report 02-170; issued July 15, 2003). In the attached excerpt, it addresses the topic of golf course turfgrasses, including *A. stolonifera*, due to the presence of golf courses in or near the parks, stating (p. 30; emphasis added):

"The development of glyphosate resistant cultivars of these know invaders of riparian habitats means that they will be resistant to Rodeo, one of the very few herbicides registered for use near riparian areas and wetlands. It is therefore **absolutely critical that these cultivars not be introduced** into the parks."

These arguments surely apply to other parks and protected areas off all kinds beyond Sequoia-Kings Canyon and Yosemite as well, based on the ability of *A. stolonifera* and its weedy relatives to invade numerous natural habitat types.

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Appendix 5. Neal Paper

A detailed critique of the concept of glyphosate resistant turf was provided by a Professor of Weed Science at North Carolina State University: Neal, J.C. 2000. Herbicide resistant turfgrasses - Panacea or problem? *Turfgrass Trends*, Mar. pp.4-7, attached. So many negative outcomes of widespread adoption of such turf products are identified that is difficult to excerpt them and still do the paper justice. They fall into the categories of : 1) drastically increased glyphosate resistance; 2) creation of new resistant strains of annual bluegrass and other weeds; and 3) loss of the predominant landscaping and turfgrass renovation herbicide. He offers the blunt opinion that “glyphosate-resistant turfgrass is a bad idea” and concludes that the “law of unintended consequences is in play here.” (p. 7). APHIS should heed his cautions.

NRC/NAS Report on Biological Confinement

APHIS has the NRC/NAS report on Biological Confinement of Genetically Engineered Organisms (issued Jan. 20, 2004), therefore it is not attached. Transgenic turfgrasses are discussed in detail (pp. 97-105). This expert review remarks on the high risk of fertile *Agrostis* species, among others. It highlights the importance of wind turbulence and whirlwinds in pollen distribution, noting the difficulty of modeling and assessing transgene flow where these are present (p.103). It also notes the numerous difficult-to-assess vectors for rhizome, stolon, and seed transport (p. 104). The Monsanto/Scotts petition does not address any of these assessment difficulties.

The NRC/NAS warns (p.104; emphasis added):

“[T]ransgenic turfgrasses, perhaps especially creeping bentgrass, can be considered potentially difficult to confine.....Transgenic turfgrasses carry a particularly high risk of escape.....More intensive bioconfinement methods, such as the use of plastid transgenesis and male sterility **are needed** in genetically engineered turfgrass production.”

Again, the Monsanto/Scotts petition fails to address these bioconfinement alternatives. A decision by APHIS to approve the proposed non-bioconfined variety “as is” would directly contradict the NRC/NAS conclusions, above.

Summarizing the evidence CFS/CTA have submitted earlier in their Listing Petition and the supplement thereto, plus the evidence newly submitted and discussed herein, one compelling fact emerges: far more than for any other GE crop, numerous Ph.D.s are offering clear opinions on the record opposed to it. These include: John Randall and Marilyn Jordan of TNC; Faith Campbell of TNC (formerly of American Lands, who is a co-plaintiff in the CFS/CTA litigation); Albert Kausch, Associate Professor of Plant Sciences at the Univ. of Rhode Island; Joseph Cummins, J.D. Gerlach, Jr. (lead author), and J.C. Neal, whose contributions are discussed above; and Thomas K. Hodges, Professor Emeritus of Purdue University (discussed again below). This is **eight experts** stating, at least, that significant environmental

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impacts are foreseeable. We are sure that other Ph.D.s also have submitted negative comments in this docket and, of course, many other non-Ph.D.s are on the record in opposition as well. Supporting documentation submitted by Monsanto and APHIS does not match the opposing level of expertise.

NEPA CONCERNS

Under NEPA, all Federal agencies are required to prepare a “detailed statement” (or EIS) regarding all “major federal actions significantly affecting the quality of the human environment . . .”⁶ The Council on Environmental Quality (CEQ), which oversees NEPA implementation by Federal agencies, has adopted regulations listing factors for determining the potential “significance” of an action’s effects. Those factors most pertinent to this novel GE turfgrass proposal include (emphasis added):

- *the degree to which the proposed action affects **public health** or safety,*
- *the degree to which the effects on the quality of the human environment are **likely to be highly controversial,***
- *the degree to which the possible effects on the human environment **are highly uncertain or involve unique or unknown risks,***
- *the degree to which the action **may establish a precedent for future actions** with significant effects or represents a decision in principle about a future consideration.*
- *the degree to which the action may adversely affect an **endangered or threatened species** or its habitat that has been determined to be critical under the Endangered Species Act of 1973.⁷*

According to Court decisions, the “presence of one or more of these factors should result in an agency decision to prepare an EIS.”⁸

The presence here of public health impacts, scientific controversy, unique risks, and endangered and threatened species impacts, and the precedent-setting nature of this proposal plainly establish the potential

⁶ 42 USC § 4332(C).

⁷ 40 CFR § 1508.27(b)(2), -(4), -(5), -(6), -(9). The Supreme Court has held that the CEQ regulations are entitled to substantial deference. Andrus v. Sierra Club, 442 U.S. 347, 348 (1979); Marsh v. Oregon Natural Resources Council, 490 U.S. 360, 372 (1989).

⁸ Public Service Co. of Colo. v. Andrus, 825 F. Supp. 1483, 1495 (D. Idaho 1993).

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for “significant” impacts, mandating a decision to prepare a full EIS. As indicated in Box 1, a potential **public health** risk exists for applicators, golfers, and neighbors as a result of foreseeably increased glyphosate use and misuse. The scientific discussion above proves there is **scientific controversy** (at least 8 Ph.D.s directly opposed) and **unique risks** not posed by any other GE crop currently on the market. Further, simply granting deregulated status would allow unrestricted commercial release of the product. The resulting weed invasions and gene flow of the glyphosate resistance trait and related impacts could manifest themselves in every conceivable location where there is a market for grass seed, plugs or turf rolls in the country, in short, virtually everywhere people reside, except perhaps the most arid desert zones. Recall of the product under APHIS’s current authority is not an option; even if it were, recall would not be feasible once the product is fully commercialized and planted. In short, the proposal is for an essentially irreversible action and, as the first GE turfgrass proposal, approving it would establish a **precedent** as to how the several foreseeable additional turfgrass varieties will be assessed and regulated. In addition, as discussed in the following section of this comment, substantial direct and indirect effects on **endangered or threatened species** are foreseeable.

APHIS has never prepared a full EIS before on its dozens of previous approvals for broad releases of GE crops, now covering tens of millions of acres. Instead, deregulation has rested on relatively short and non-transparent Environmental Assessments (EAs). Several commenters have criticized the quality of APHIS’s crop-by-crop EAs. Indeed, the National Academy of Sciences, following a thorough review, recently concluded:

APHIS assessments of petitions for deregulation are largely based on environmental effects considered at small spatial scales. Potential effects from scale-up associated with commercialization are rarely considered.⁹

This bland assertion presents a stunning indictment of APHIS’s NEPA work, indicating the agency is using “quick and dirty” EAs looking at small spatial scales in lieu of full EISs in which “potential effects from scale-up associated with commercialization” are fully considered. With GE turfgrasses, the scaled-up impacts could occur in virtually every county in this incredibly environmentally-diverse country; in other words scale-up would be far more sweeping than virtually any GE agricultural row crop. (Recall that TNC has identified 18 distinct habitat types in which *A. stolonifera* already has invaded.) The fact that it will be tremendously difficult to predict the impact that making creeping bentgrass glyphosate resistant will have across diverse habitat types means that the highest level of NEPA analysis is called for.

On the positive side, APHIS has committed to preparing a full EIS prior to the step of allowing any

⁹ National Research Council/National Academy of Sciences. 2002. *Environmental Effects of Transgenic Plants: The Scope and Adequacy of Regulation*. Washington, DC., at p. 189.

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unconfined field release of a proposed biological control agent for a cotton pest, the sterile GE pink bollworm, in a very limited cotton-growing area near Phoenix, Arizona.¹⁰ This step is far short of approving deregulated status as is proposed in the current docket. Few, if any, biologists could sensibly argue that the broad unmonitored release and sale of an invasive, fully fertile, Roundup Ready turfgrass throughout the vast wholesale and retail markets would pose less significant environmental impacts than the limited field release, in an isolated cotton growing area, of a GE cotton pest that is sterile and being closely monitored by a USDA research institute.

An EIS would allow full consideration of the various alternative approaches to the proposed commercialization of glyphosate resistant creeping bentgrass:

- The most prominent alternative is one that has been advocated extensively by other scientists and turfgrass breeders, that is, limiting approval to a male sterile variety; see the comment of Thomas K. Hodges, Professor Emeritus, Purdue University dated Mar. 1, 2004, filed by email in the present docket, which emphatically states (emphasis in original): **“The deregulation of the event in question is 100% sure to lead to an environmental disaster.”** The existence of male sterile variety as a feasible and safer alternative cannot be ignored when considering the Monsanto/Scotts proposal.
- Another alternative is the approach of attaching mitigating conditions limiting the use of the product to golf courses, imposing resistance management requirements to mitigate the development of Roundup resistant weeds, and imposing other enforceable stewardship requirements. (Note that even if current authority may not appear to allow such actions, such an alternative still may be appropriate for examination in an EIS: CEQ 40 Most Asked NEPA Questions - Question 2B: “An alternative that is outside the legal jurisdiction of the lead agency still must be analyzed in the EIS if it is reasonable.”)
- Still another alternative is the use of non-engineered glyphosate resistant varieties. Several have been developed through traditional breeding and selection; they don’t present the same outcrossing risks as fully fertile GE varieties do.¹¹

A final Record of Decision (ROD) based on a preferred alternative developed pursuant to a full EIS

¹⁰ APHIS Notice of Intent to prepare an Environmental Impact Statement on the proposal by USDA APHIS to conduct field releases of a transgenic pink bollworm, *Pectinophora gossypiella* (Lepidoptera: Gelechiidae), docket No. 01-024-1, 63 FR 5086-5087, dated Feb. 4, 2002.

¹¹ See Rose-Fricke, C. 2000. Poa annua-free turf - A dream or newfound reality? *Turfgrass Trends* vol. 9, no. 2, Feb. pp. 1-4.

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would achieve the best and most transparent decision. If a decision were made to approve the proposal, the ROD process also would allow imposition of appropriate mitigation, monitoring, and enforcement conditions in the most binding way (see 40 CFR 1505.3, Implementing the Decision: discussing the imposition of such conditions through a ROD; and CEQ 40 Most Asked Questions - Question 19a and b, and 34c).

Further, NEPA requires preparation of a full EIS whenever a potentially significant impact is present even if in the judgment of the action agency that impact is outweighed by potential benefits (CEQ NEPA regulation, 40 CFR § 1508.8 - Definition of “effects”: “Effects may also include those resulting from actions which may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial”; and § 1508.27(b)(1) - under Definition of “significantly”: “.....A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial”). A full EIS is plainly the next appropriate NEPA step. The interim Environmental Assessment step can and should be bypassed (CEQ NEPA regulation, 40 CFR § 1501.3(a) - When to prepare an environmental assessment: “....An assessment is not necessary if the agency has decided to prepare an environmental impact statement”).

ENDANGERED SPECIES ACT CONCERNS

Parallel to the duty to comply with NEPA, APHIS has a duty under Sec. 7 to consult with the U.S. Fish and Wildlife Service (USFWS) with respect to threatened and endangered (T/E) species for all GE products it is considering approving. If an APHIS regulatory action may affect listed T/E species or their critical habitats, then the agency must engage in a formal consultation and obtain a biological opinion (BO), typically from the USFWS.¹² To adequately review the effects of the action, APHIS must first provide the USFWS with “the best scientific and commercial data available” regarding which, if any, T/E species may be impacted.¹³ The USFWS must review this information, evaluate the status of impacted species and determine the direct, indirect, and cumulative effects of the action. If the APHIS action is likely to jeopardize a T/E species or adversely modify designated critical habitat, then the USFWS BO must seek to identify reasonable and prudent alternatives.¹⁴

More than 500 native U.S. animals and more than 735 native U.S. plants are listed as T/E species; and

¹² 16 USC § 1536(b).

¹³ 50 CFR § 402.14(d).

¹⁴ 16 USC § 1536(b)(3)(A).

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many of these have designated or proposed critical habitats.¹⁵ As a general matter, invasive non-native grasses can harm these species and the habitats upon which they depend. For example, the TNC preserves impacted by *A. stolonifera* referenced in Appendix B to the CTA/CFS Noxious Weed Petition include many rare species of plants and animals; several include Federally-listed or candidate T/E species and their designated or proposed critical habitats, and State-listed species (pp. 3-5, therein). That is why these preserves typically are established. APHIS should commit to proactively investigating, in consultation with the USFWS, potential T/E impacts not only for those TNC preserves but also every other park and natural area that invasive GE varieties of these turfgrasses may affect.

While this task may sound impossibly sweeping, assertions by Monsanto and Scotts in the petition suggest that the actual acreage foreseeably covered by these new GE varieties would only amount to somewhere in the likely maximum range of 75,000 acres (petition, at p. 26). Given that, it should be reasonably feasible to assess where that relatively small, while scattered, acreage would lie in relation to the locations of those T/E species, if any, that the use of the product may jeopardize or put at risk, as well as any designated critical habitats that may be adversely modified. Rather than assessing generalities, real-world impacts can and must be assessed at the level of each Fish and Wildlife Service Endangered Species Field Office and the results combined into a national BO.

In addition, the expected increased use of glyphosate must be assessed under Sec. 7. Glyphosate use and misuse plainly can affect T/E species. Attached hereto as **Appendix 6** is an excerpt from the 1986 EPA Guidance for the preregistration of pesticides containing glyphosate that discusses the many specific T/E species that, according to the Fish and Wildlife Service Office of Endangered Species (OES) may be “jeopardized” or “put at risk” by use of the compound. This 1986 information surely needs updating in view of the many additional listed species and critical habitat designations since. The Monsanto/Scotts petition is devoid of any attempt to either generally or specifically discuss T/E impacts nationwide that would result if the petition were approved. One short “tacked on” paragraph discusses and dismisses impacts on non-target organisms (p. 282). This cursory treatment patently fails to lay the groundwork for APHIS’s required ESA compliance.

The National Park Service’s (NPS) scientists also list creeping bentgrass as an invasive weed, as indicated in the CTA/CFS Noxious Weed Listing Petition (p. 5). As the national parks and other Federal lands such as Bureau of Land Management lands, national forests, and national grasslands could suffer impacts from GE herbicide resistant turfgrasses, APHIS should also consult with those Federal land management agencies. The Sec. 7 BO and NEPA EIS processes would enable that needed interagency, interdisciplinary review.

CONCLUSION

¹⁵ USFWS. 2001. *Endangered Species Bulletin*, vol. XXVI, no. 1, p. 40.

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No doubt exists that, when viewed cumulatively, the potential impacts of the proposal are significant. The scientific documentation, expert opinion, and other evidence indicates that the Monsanto/Scotts petition is precedent setting in the arena of GE crops as it will be the first one for which a full EIS and full BO must be prepared prior to any APHIS decision on whether to grant or deny the petition. We look forward to providing new information as those processes move forward.

Thank you for the opportunity to submit these comments; we look forward to your written responses to each of them separately. For further information regarding this comment, please contact Peter T. Jenkins, Attorney/Policy Analyst, tel: 202.547.9359; email: peterjenkins@icta.org .

Sincerely,

Andrew Kimbrell
CTA/CFS Executive Director

Peter T. Jenkins
Attorney/Policy Analyst

Attachments: Appendices - 1 through 6

CTA/CFS July 18, 2002, Noxious Weed Listing Petition and 4 appendices.

CTA/CFS Apr. 21, 2003 supplement to Noxious Weed Listing Petition and Tabs 1 and 5 through 12.

APPENDIX 1

Noxious Weed Listing Petition and Litigation Status

APHIS's Noxious Weed Program acknowledged receipt of, and briefly responded to, the CTA/CFS July 18, 2002, Noxious Weed Listing Petition by way of a letter dated September 18, 2002. The letter stated the agency refused to consider the Listing Petition because the turfgrass varieties at issue, glyphosate tolerant creeping bentgrass and Kentucky bluegrass, were GE. CTA/CFS sought a reversal of the agency's refusal to consider the Petition by subsequent letters without success. As a result, CTA/CFS filed their lawsuit in Federal court on January 8, 2003, seeking, *inter alia*, to compel APHIS to respond to the Listing Petition. (ICTA et al. vs Veneman et al., US Dist Ct., DC. Case No. 1:03CV00020)

APHIS later reversed itself as far as refusing to respond to the Listing Petition. By a letter dated May 13, 2003, and accompanying documents, APHIS responded to it, denying it for both varieties. One of those accompanying documents was the Pest Risk Analysis (PRA) conducted on GE creeping bentgrass by the APHIS Noxious Weed Coordinator, Alan Tasker. Monsanto/Scotts have submitted this PRA in support of their deregulation petition. CTA/CFS amended their lawsuit to challenge APHIS's denial decision as arbitrary and capricious and in violation of various laws. The amendment also added several individual and non-profit groups as plaintiffs that are based in Virginia and Oregon, where several GE turfgrass field tests are occurring.

APHIS's PRA did not respond to any of the more than 16 documents and other references in the initial and supplemental submissions in support of the CTA/CFS Listing Petition. Further, APHIS failed to respond to scientific information submitted by other outside experts. APHIS's response relied not on the plain terms of the Plant Protection Act noxious weed provisions, but instead on international trade laws that are irrelevant because the creeping bentgrass variety complained of was created in the United States, is in fact being planted in the United States now, and is not being proposed for import into the United States.

The lawsuit is still in preliminary stages with no decision on any of the merits of the action. Resolution is anticipated to take another year, with possible appeals by the losing side thereafter. It would be prudent for APHIS to withhold any decision on the creeping bentgrass deregulation petition until the lawsuit is resolved. Should the deregulation petition be granted and the creeping bentgrass variety at issue be commercialized, and subsequently the Federal courts were to rule that APHIS had failed to properly consider the Noxious Weed Listing Petition for that variety, then APHIS could be compelled to order a massive and expensive recall of the product by Monsanto and Scotts and their distributors.

APPENDIX 2

Email Message on International Market Impact

-----Original Message-----

From: Jack Crow [mailto:Jack.Crow@arc.govt.nz]
Sent: Thursday, February 19, 2004 6:27 PM
To: aliens-l@indaba.iucn.org
Subject: Re: [Aliens-L] GMO

It is predicted that most or all regulatory bodies in New Zealand will strenuously oppose the importation of any modified form of *Agrostis stolonifera*, which is already a well known weed of damp ground, boggy sites, disturbed ground, native grassland, introduced pasture (particularly of low-medium fertility) and open shrubland. It is also a nuisance sp in some turf situations, so a "Roundup-ready" form would be a damn curse. Any attempts to use glyphosate in turf or other situations where *A. stolonifera* is present will result in lots more of the weed.

Given that glyphosate is the most commonly used herbicide in turf culture, and this sp is a common weed in turf, the plan to introduce this new product might well backfire in sales terms, at least in New Zealand (er, we may be insignificant in trade terms but the idea is still exportable!).

It is expected that other countries with *A. stolonifera* as a weed will also oppose importation. Perhaps a greater issue will be preventing accidental introduction, or illegal importation by those who may be persuaded to plant *A. stolonifera*.

I'm horrified by the thought that any species with demonstrably weedy characteristics anywhere, could be considered for treatment to make it harder to kill. Is there no international convention re GMOs that restricts release where off-site effects can be predicted to be deleterious?

Jack Crow
Biosecurity Manager
BIOSECURITY
Auckland Regional Council
Te Rauhitanga Taiao