CITIZEN PETITION TO THE SECRETARY
UNITED STATES DEPARTMENT OF AGRICULTURE

Petition on Genetically Engineered Turfgrasses, including a Noxious Weed Listing Petition
Submitted by: International Center for Technology Assessment and the Center for Food Safety
Date: July 18, 2002

EXECUTIVE SUMMARY

This Citizen Petition seeks specific actions by the Secretary of the United States Department of Agriculture (USDA) and by the Animal and Plant Health Inspection Service (APHIS) related to the regulation and analysis of genetically engineered (GE) turfgrasses. The Requested Actions include:

- **Approve** the Petition herein to list GE glyphosate resistant creeping bentgrass (GE *Agrostis stolonifera)* and GE glyphosate resistant Kentucky bluegrass (GE *Poa pratensis*) as noxious weeds under the Plant Protection Act.

- **Deny** the petition for deregulated status submitted by Monsanto Co./Scotts Co. for GE glyphosate resistant creeping bentgrass, No. 02-122-01p.

- Commit to preparing a full Environmental Impact Statement under the National Environmental Policy Act (NEPA) on the impacts of deregulation of GE glyphosate resistant turfgrasses, and amend the APHIS NEPA implementing regulation, which now presumes an Environmental Assessment suffices for releases of GE species.

- Improve the agency's compliance with the Endangered Species Act, Executive Order 13112 on Invasive Species and other conservation duties.

Weed experts recognize creeping bentgrass and Kentucky bluegrass as invasive weeds in a broad variety of habitats. Several prominent organizations, including The Nature Conservancy and the American Society of Landscape Architects, already have submitted separate, well-supported, comments to APHIS asking for a moratorium on any GE herbicide resistant turfgrass varieties. Unlike most other GE crops, the GE turfgrasses proposed for deregulation aim directly at the vast consumer and commercial markets. Once planted out as seeds, plugs and turf rolls - on public and private land of every conceivable kind - it would be impossible to recall them; they would represent a unique man-made form of biological pollution. Impacts could include outcompeting and genetically contaminating both native vegetation and other non-native turfgrasses; increasing overall herbicide use, misuse and related impacts; increasing herbicide resistance in other weeds; and a broad array of indirect environmental and economic impacts. These potentially irreversible impacts

could occur across the country and even globally. APHIS's regulatory duty is to ensure that the risks of these impacts are fully assessed and minimized or avoided outright.

TABLE OF CONTENTS

BACKGROUND

Petitioners are the *International Center for Technology Assessment* (CTA) and the *Center for Food Safety* (CFS) and their undersigned individual members and officers. CTA and CFS are non-profit, membership organizations located at 660 Pennsylvania Ave. SE, Suite 302, Washington, DC 20003. Petitioner CTA is devoted to fully exploring the economic, ethical, social, environmental and political impacts that can result from the applications of technology.

Petitioner CFS was established to address the increasing concerns about the impacts of our crop production systems on human health, animal welfare and the environment. Petitioners, together with their many active members, have diverse economic, recreational, health, conservation and aesthetic interests that may be negatively impacted by the development and release of GE turfgrasses.

Pursuant to the Right to Petition Government Clause in the First Amendment to the United States Constitution,[1] the right to petition for new or amended regulations under the Administrative Procedure Act,[2] USDA's implementing regulations,[3] and the noxious weed petition process set forth in the Plant Protection Act,[4] the Petitioners respectfully submit this Petition to the Secretary of Agriculture seeking dramatic improvements in USDA's treatment of GE turfgrass proposals.

GE TURFGRASSES AND APHIS

Turfgrasses are perennials, generally planted as permanent ground cover. They are among the most common plants in the world. They are wind pollinated, their pollen is light and blows easily, and they typically readily outcross to other grass species (interspecific hybridization). Some species'

---

[1] "Congress shall make no law ... abridging ... the right of the people ... to petition Government for a redress of grievances." U.S. Const., amend. I. The right to petition for redress of grievances is among the most precious of the liberties safeguarded by the Bill of Rights. United Mine Workers of America, Dist. 12 v. Illinois State Bar Ass'n, 389 U.S. 217, 222 (1967). The Supreme Court has recognized that the right to petition is logically implicit in, and fundamental to, a republican form of government. United States v. Cruikshank, 92 U.S. (2 Otto) 542, 552 (1875).

[2] 5 USC § 553(e).

[3] 7 CFR § 1.28.

[4] 7 USC § 7712(f)(2)

seeds can remain viable for 10 to 15 years. Bentgrasses in particular also spread vegetatively by rhizomes and stolons. Turfgrasses are ubiquitous in and near almost every type of habitat in which the U.S. populace lives, works and recreates, including an estimated 40,000,000 residential lawns and parks, at least 40,000 athletic facilities, more than 17,000 golf courses, and countless other landscapes where they have been planted or invaded on their own.[5]

Turfgrass is the second largest seed market in the United States after hybrid corn, with annual sales estimated between $580 million and $1.2 billion.[6] The U.S. turfgrass seed export market amounts to $70 million per year.[7] Scotts Company executives are reported to believe the eventual market for GE lawn products will reach **$10 billion**.[8]

To date, USDA APHIS has allowed field trials and interstate movements of GE varieties of creeping bentgrass, Kentucky bluegrass, bermudagrass, perennial ryegrass, *Poa pratensis* X *P. arachnifera* crosses, St. Augustine grass, velvet bentgrass and other GE grasses. Currently, the agency is considering a petition for deregulated status submitted in May, 2002, by Monsanto/Scotts for glyphosate (Roundup™) tolerant GE creeping bentgrass (APHIS No. 02-122-01p). This, the first ever proposal to commercialize a GE lawn product, aims directly at the vast golf course, homeowner and landscaping markets.

Prominent stakeholder organizations including the American Society of Landscape Architects (ASLA) (more than 14,000 members nationally), the Foundation on Economic Trends (FET), and The Nature Conservancy (TNC), the largest holder of private land preserves in the world, have already submitted detailed comments to APHIS urging a moratorium on release of GE turfgrasses (attached in Appendices A and B, respectively). The ASLA and FET based their moratorium request on these potential impacts (Appendix A):

---

[5] Edminster, C.W. 2000. Future of turfgrass breeding techniques. Keynote address, Millennium Turfgrass Conference Proceedings, June 5-9, Melbourne, Australia; golf course estimate from statement submitted by U.S. Golf Association to Oregon Department of Agriculture referenced in the Hearing Officer's Report, In the matter of proposed rulemaking hearing: bentgrass control area in Jefferson County. Oregon Dept. of Agric., Jan 18, 2002.

[6] Lee, L. 1996. Turfgrass biotechnology. *Plant Sci.* 115:1-8.

[7] Figure from American Seed Trade Association, reported in Anon. 2001. Researcher: don't tread on turf made through genetic engineering. *Providence Journal*, Aug. 17.

[8] Barboza, D. 2000. Suburban genetics: scientists searching for a perfect lawn. *New York Times*, July 8.

> *...the likelihood of build up of herbicide tolerant weeds as well as the spread of herbicide tolerant and slow growth genes to wild grasses, with unintended consequences to the flora and fauna of ecosystems across the United States. These introductions may also raise potential liability issues if genes flow to neighboring landscapes and properties contaminating successive generations of conventional plants with engineered genes.*[9]

The TNC letter contains extensive scientific documentation on the weediness of *A. stolonifera* and *P. pratensis,* discussed below. Nevertheless, APHIS has not announced the moratorium sought by those groups.

If APHIS approves the Monsanto/Scotts deregulation petition, 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."[10] 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.

The most direct impact that Petitioners fear is these GE turfgrasses will become worse weeds in areas where they are not wanted. This phenomenon already has occurred in crop fields with another

---

[9] ASLA also addresses other problems with GE plants on its website, at www.asla.org/Members/publicaffairs/factsheets/genmodorg.html and www.asla.org/governance/policies/transgenic.htm .

[10] Wipff, J.K., and C. Fricker. 2001. Gene flow from transgenic creeping bentgrass (*Agrostis stolonifera* L.) in the Willamette Valley, Oregon. Report prepared for the Oregon Dept. of Agric., Plant Division, by Pureseed Testing Inc., Hubbard, OR, p. 8.

weedy, herbicide resistant crop, GE canola, according to a report by The Royal Society of Canada:[11]

> *Unfortunately, herbicide-resistant volunteer canola plants are beginning to develop into a major weed problem in some parts of the Prairie Provinces of Canada. Indeed, some weed scientists predict that volunteer canola could become one of Canada's most serious weed problems because of the large areas of the Prairie Provinces that are devoted to this crop. Of particular concern is the occurrence of gene exchange via pollen among canola cultivars resistant to different herbicides. This can occur through crosses between volunteer plants and the crop, or between different volunteer plants.*

Thus, precedent exists for increased weediness impacts from GE products, a precedent that clearly urges caution. But, volunteer canola, while a field weed, is not a recognized weed in natural and residential landscapes, as are creeping bentgrass and Kentucky bluegrass and the many relatives with which they readily hybridize.

Beyond their impacts as weeds, the potential indirect impacts of GE herbicide resistant grass invasions include:

- increased glyphosate use, misuse, and resultant foreseeable chemical pollution, damage and injuries; the very purpose of the product being to allow turfgrass managers and landowners of all types to spray more Roundup weed killer on a broadcast rather than a spot basis;[12]

- increased glyphosate resistance in weeds such that they will be more harmful in the future; as more and more glyphosate is sprayed the selection pressure on weeds to develop resistance will increase; resistance to this weedkiller already has occurred in populations of the major crop weed annual ryegrass (*Lolium rigidum*) in Australia due to spraying Roundup, in some cases after as few as seven applications[13]; other U.S. reports exist of glyphosate resistance

---

[11] Royal Society of Canada. 2001. *Elements of Precaution: Recommendation for the Regulation of Food Biotechnology in Canada*. Ottawa, Ontario, at pp. 122-123. Extensive additional documentation exists on the weediness of GE canola, e.g., I. Bell. 2001. "Zero-Till Farmers Air Roundup Ready Concerns" *Western Producer*, Dec. 6.

[12] See the Roundup instructions and label information listing myriad foreseeable harms from its misuse, online at www.farmsource.com/Labels/RUPOrig_CG.pdf , accessible through the Monsanto website, www.monsanto.com .

[13] Muntz, S. 2002. The development of herbicide resistance in Australia: what we can learn from it. Unpublished report of the Western Australia Herbicide Resistance Initiative posted

in goosegrass (*Eleusine indica*), a major annual grass weed, in Wisconsin, and horseweed (*Conyza canadensis*), a crop weed, in Delaware;[14]

- economic harm due to genetic contamination of fields of non-GE turfgrasses intended for conventional markets, and the necessity for the impacted turfgrass farmers to use more expensive,
environmentally damaging, and even dangerous herbicides instead of glyphosate to kill GE infestations; and

- economic harm to organic farmers near any GE grass plantings because of the increased presence of adventitious GE materials in their crops and the potential for increased herbicide contamination, both of which are rejected by premium markets for organic products.

Given the serious risks outlined above to a broad variety of stakeholders, nothing can excuse a failure to apply the highest standard of scientific scrutiny to novel herbicide resistant turfgrasses. For this reason, Petitioners request APHIS promptly to undertake the following five actions, each of which is necessary and carefully tailored to the problems presented.

REQUESTED ACTIONS

1. Noxious Weed Listing Petition

---

on Agnet news service, University of Guelph, Ontario, July 16; Agnet is archived at: www.plant.uoguelph.ca/safefood/archives/agnet-archives.htm ; see also, J. Gressel. 1996. Fewer constraints than proclaimed to the evolution of glyphosate-resistant weeds, *Resistant Pest Management* 8:2; online at: www.msstate.edu/Entomology/v8n2/news.html .

[14] Doll, J. 1999. Glyphosate resistance in another plant, *Wis. Crop Manager Newsletter*, (Univ. of Wis., Madison), Dec.; and unpublished report, Group G/9 resistant horseweed (*Conyza canadensis*) USA: Delaware, *International Survey of Herbicide Resistant Weeds*, online at: http://www.weedscience.org/Case/Case.asp?ResistID=5086, and other related reports at that site.

Statutory authority.

The Federal Plant Protection Act, codified at 7 USC § 7701 *et seq.,* regulates noxious weeds.[15]

- § 7702(10), defines a *noxious weed* as:

- any plant or plant product that can directly or indirectly injure or cause damage to crops (including nursery stock or plant products), livestock, poultry, or other interests of agriculture, irrigation, navigation, the natural resources of the United States, the public health, or the environment.

- § 7712(f) provides:

(2) Petition to add or remove plants from regulation - Any person may petition the Secretary to add a plant species to, or remove a plant species from, the regulations issued by the Secretary under this subsection.

(3) Duties of the Secretary - In the case of a petition submitted under paragraph (2), the Secretary shall act on the petition within a reasonable time and notify the petitioner of the final action the Secretary takes on the petition. The Secretary's determination on the petition shall be based on sound science.

Argument in support of Noxious Weed Listing Petition.

The Secretary should list GE glyphosate resistant creeping bentgrass (GE glyphosate resistant *A. stolonifera*) and GE glyphosate resistant Kentucky bluegrass (GE glyphosate resistant *P. pratensis*) as noxious weeds under the Plant Protection Act. If seeds, plugs and turf rolls of these novel glyphosate resistant varieties are allowed out into the wholesale and retail marketplaces, aggressively marketed - as Scotts plans to do - and planted by every conceivable type of property owner they would be impossible to recall.[16] Impacts they cause could be essentially irreversible across the

[15] To date, APHIS has issued no new regulations to implement the Plant Protection Act; noxious weeds are listed under 7 CFR 360.

[16] Wayne Horman, Scotts' Director of Marketing and Sales, stated: with respect to GE creeping bentgrass, "...our philosophy is that we'll probably broadly license this technology out," quoted in J. Joyner. 2002. Turf researchers debate biotech buffer zones. *Golf Course News* Jan.

country and, due to the massive U.S. grass seed export market ($70 million/yr), eventually across the planet.

The evidence, including that in the Appendices which is incorporated herein by reference, indicates that non-GE creeping bentgrass and Kentucky bluegrass are aggressively weedy in numerous habitat types. This Noxious Weed Listing Petition addresses only the GE glyphosate resistant varieties of these species, for which the evidence is strong that they will be even worse natural area, agricultural and landscape weeds than their parent species. Below is the evidence from weed scientists, preserve managers, turfgrass experts, State agricultural officials and other reliable sources, placed into separately lettered categories:

Evidence A: Expert-developed invasive weed lists.

A. stolonifera and *P. pratensis* are 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 both species as alien plant invaders of natural areas.[17] The lists are on a website hosted by the National Park Service (NPS) and the NPS contributed data in support of both of those listings, indicating that agency scientists considers them to be invasive weeds in one or more national parks. Also, the preeminent scientific society in this field, the Weed Science Society of America, classifies both species as weeds.[18]

Similarly, the Pacific Northwest Exotic Pest Plant Council lists both species.[19] *A. stolonifera* is classified as "most invasive - regional (highly to moderately invasive but still with a potential to spread)"; *P. pratensis* is classified as "most invasive - widespread." Indeed, Monsanto's own website lists bentgrass (*A. Spp.*) and Kentucky bluegrass as weeds that Roundup is formulated to control.[20] Little doubt exists that scientists broadly recognize these species as serious weeds.

Evidence B: The Nature Conservancy report on natural area invasions.

---

[17] Website at www.nps.gov/plants/alien/list/a.htm .

[18] Website at www.wssa.net under "Weed Information" and "Plant Names".

[19] Website at www.wnps.org/eppclist.html .

[20] Website at www.roundup.com/weeds/allweeds.html ; these species also are listed as target weeds on the Roundup label, online at www.farmsource.com/Labels/RUPOrig_CG.pdf .

Appendix B contains seven peer-reviewed citations, five references from botanical manuals, two unpublished reports and twelve personal communications from TNC preserve managers, which confirm weediness of *A. stolonifera* and *P. pratensis* beyond any reasonable doubt. They are documented to have invaded in dozens of states and several provinces, and elsewhere around the world. The diverse habitat types damaged include: boreal forest, riparian sedge, a sub-Antarctic island, mid-successional fields, Northern Rockies montane trailsides, open canopy woodlands, shrublands, shrub-steppe, rare calcerous fens, rare native grasslands and prairies, moist meadows, swamps, coastal marshes, dunes, shorelines, swales, ditches, "literally every riparian zone," pastures, "cow concentration areas," urban streets and vacant lots. (That totals 23 at least somewhat discrete habitat types.) One TNC preserve manager condemned *P. pratensis* in almost admiring fashion: "The species is so ubiquitous that is has the potential to eat up entire exotic species management budgets." (Appendix B, p. 6.)

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."[21]

Based on the evidence she gathered, Marilyn Jordan, Ph.D., a TNC ecologist, pleaded with APHIS (Appendix B cover letter, emphasis in original):

> *....bentgrass and other turfgrass are indeed widespread and serious weeds across the United States and Canada. We sincerely hope that.... these herbicide resistant turfgrasses will NOT be released for commercial use. I also hope that all field tests of herbicide resistant turfgrasses will be stopped immediately. Because of the great distances which pollen can be carried it is highly likely that the gene for herbicide resistance will inevitably escape into the environment, if it hasn't already.*

TNC's report concludes:

> *Ultimately permits may be sought for commercial release of herbicide-resistant bentgrass and bluegrass. Field tests of these grasses are likely to result in escape of herbicide-resistance into surrounding natural areas, since*

[21] 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.

wind borne pollen carries long distances. Commercial release would almost certainly guarantee escape of this trait.

Evidence C: The International Survey of Herbicide Resistant Weeds.

A non-GE *A. stolonifera* developed herbicide resistance in Belgian orchards as a result of selection due to herbicide applications. This form is separately recognized as a weed by the International Survey of Herbicide Resistant Weeds.[22] This portends that an intentionally engineered herbicide resistant form of *A. stolonifera* also likely would be listed as a weed.

Evidence D: The White House Council on Environmental Quality (CEQ) and Office of Science and Technology Policy (OSTP) draft case study sidebar.

The CEQ and OSTP "Case Studies of Environmental Regulation for Biotechnology" were published in January, 2001. A draft case study sidebar on GE herbicide resistant creeping bentgrass, which was never published, excerpts of which are attached hereto as Appendix C, contains extensive evidence of the species' weediness in lawns and other domesticated situations.

This evidence comes from State Cooperative Extension Service agents, who possess extensive on-the-ground experience. For example, in Ohio: "The most common perennial weed grasses in lawns are creeping bentgrass, quackgrass and tall fescue"; and in Indiana: "Creeping bentgrass growing in taller mown turf stands used as home lawns, golf course rough, or athletic fields is a very invasive weed. Currently, no selective control for creeping bentgrass in taller mown stands is available." Several of the sources cited in Appendix C also mention bluegrasses as serious lawn weeds.

Evidence E: Turfgrass experts with Pure Seed Testing, HybriGene and Turf Seed, Inc.

Petitioners attach as Appendix D the report by Joseph K. Wipff, Ph.D., and Crystal Fricker, "Gene flow from transgenic creeping bentgrass (*Agrostis stolonifera* L.) in the Willamette

[22] Heap, I. 2002. *The International Survey of Herbicide Resistant Weeds*, website at: www.weedresearch.com/in.asp .

Valley, Oregon" prepared for the Oregon Department of Agriculture.[23] This report shows in great empirical detail that planting GE bentgrass can cause the spread of GE pollen to distances further than 4,200 ft. (more than four-fifths of a mile), that *A. stolonifera* hybridizes with neighboring turfgrasses, and that these gene-flow and hybridization problems represent real contamination threats to the conventional turfgrass seed industry. APHIS should review the report thoroughly as it raises and reinforces potential ecological and economic threats that are too lengthy to summarize adequately here. The authors' key relevant conclusions are (Appendix D, p. 18):

> *1) the transgenic bar gene can flow to other species of Agrostis (i.e. interspecific gene flow); 2) intraspecific gene flow in creeping bentgrass is possible for much longer distances than traditionally theorized; [and] 3) the transgenic bentgrass plants were fertile and stable....Absolute containment of transgenes is undoubtedly often impossible. Genes can not only escape via the pollen, but also through seeds that are left in fields and lost during handling.*

The study found that GE creeping bentgrass can readily outcross with at least six related non-native species that occur near existing Oregon bentgrass plantations. These relatives are: *A. canina*, *A. capillaris*, *A. castellana*, *A. gigantea*, *A. pallens* and *A.* sp.

Note that Dr. Wipff is recognized as a turfgrass expert both by the Oregon Department of Agriculture and by APHIS for its past field test monitoring program in Oregon. His company, Pure Seed Testing, Inc., is a subsidiary of a GE turfgrass developer, Turf Seed, Inc., a major Oregon grower. Also, Albert Kausch, Ph.D., Associate Professor of Plant Sciences at the Univ. of Rhode Island, who is connected with Pure Seed Testing and a subsidiary called HybriGene, is on record against the Monsanto/Scotts proposal saying that releasing a non-sterile glyphosate resistant creeping bentgrass likely will cause serious irreversible gene flow problems, including genetic damage to Turf Seed, Inc.'s own plantations.[24] He reportedly stated: "Outcrossing is inevitable. My main concern is that we're moving ahead too fast on this."[25]

---

[23] Wipff, J.K., and C. Fricker. 2001. Gene flow from transgenic creeping bentgrass (*Agrostis stolonifera* L.) in the Willamette Valley, Oregon. Report prepared for the Oregon Dept. of Agric., Plant Division, by Pureseed Testing Inc., Hubbard, OR.

[24] Anon. 2001. Researcher: don't tread on turf made through genetic engineering. *Providence Journal*, Aug. 17.

[25] Lundgren, S. 2001. Don't rush grass research, critics say. *The Oregonian*, Nov. 20.

The President of Turf Seed, Inc., William Rose, has said (emphasis added):

> *Anyone familiar with **the Starlink case** with Aventis knows that it just about broke that company. Aventis not only had to reimburse the farms that grew the genetically modified corn, but all the farms adjacent to them paying the premium on the product produced. **I see the dangers with bentgrass being about 10-fold more.** Corn is an annual and, of course, bentgrass is a perennial. When GM pollen is received by an agrostis plant, it can just leap frog again on to another plant... Our* [the Pure Sed Testing] *study was undertaken to identify how big the problem could be, and it's huge....Any GM seed, depending on which way the wind is blowing, can end up 10 or 15 miles from a testing site....Companies currently testing with transgenic perennial grasses should cease until there's sterility in the product. Even with greater control zones established, it's still risky.*[26]

In short, leading GE grass experts contend that the only way to safely introduce the turfgrass being proposed by Monsanto/Scotts is to make it sterile.

Evidence F: Oregon Department of Agriculture report.

The Oregon Department of Agriculture's (ODA) Plant Division warned in a recent official publication on GE creeping bentgrass:

> *Cross-pollination between conventionally bred varieties and those produced using techniques of modern biotechnology can lead to an undesirable reduction in varietal purity. Reduced varietal purity is potentially harmful to the marketability of both types of bentgrass varieties... If genes for herbicide resistance escape, they could reach the Willamette Valley where bentgrass is a weed in some grass seed production systems. Alternative control methods*

---

[26] Quoted in J. Joyner. 2002. Turf researchers debate biotech buffer zones. *Golf Course News* January. The "Starlink case" referred to was a contamination fiasco caused by failed regulatory and enforcement efforts to segregate GE "Starlink" corn that had been approved only as animal feed. Misfeasance and malfeasance by suppliers and users of the corn seed ultimately lead to massive illegal GE contamination of the human food supply that cost the crop's developer, Aventis, in the range of **one billion dollars**. Further, dozens of consumers complained of sickness from food allergies resulting from eating the illegal corn product. The Environmental Protection Agency refused Aventis's request for retroactive approval of Starlink corn as human food.

would be more costly.[27]

Summary of evidence: Creeping bentgrass and Kentucky bluegrass are damaging non-native invaders in a wide variety of both natural and domesticated vegetation, for which glyphosate is the superior and least costly herbicide. The glyphosate-resistant varieties of these invaders would be demonstrably **worse** weeds than the parent species, justifying their separate classification under the Plant Protection Act's noxious weed provisions.

Based on sound scientific evidence indicating their strong potential to cause irreversible direct and indirect damage to important environmental, agricultural and economic interests, the requirements for listing the GE varieties as noxious weeds in 7 USC §§ 7702(10) and 7712(f) have been met. Failure to list GE glyphosate resistant *A. stolonifera* and GE glyphosate resistant *P. pratensis* would be arbitrary and capricious. To reiterate, they qualify as noxious weeds because they pose the following threats to the interests specified in § 7702(10):

> ***- "can directly or indirectly injure or cause damage to crops (including nursery stock or plant products), livestock, poultry, or other interests of agriculture..."*:** supported by the evidence in categories A, C, D, E and F, above.
>
> ***- "[or to] ... irrigation, navigation, the natural resources of the United States, the public health, or the environment":*** supported by the evidence in categories A, B, C, D and E, above.

The Plant Protection Act's provision on noxious weed petitions, § 7712(f)(3), above, mandates that "the Secretary shall act on the petition within a reasonable time." Here, a reasonable time is prior to any granting of deregulated status to either of these GE turfgrass varieties. If listing occurs after they are allowed to be commercialized, sold and planted across the country, the listing obviously would be too late to prevent the harmful impacts.

Requested Action 1:

Promptly approve this Petition to list novel GE varieties of creeping bentgrass (GE glyphosate resistant *Agrostis stolonifera)* and Kentucky bluegrass (GE glyphosate resistant *Poa pratensis*) as noxious weeds under 7 CFR 360.

---

[27] Notice of Proposed Rulemaking Hearing: bentgrass control area in Jefferson County, Statement of Need and Fiscal Impact. Oregon Dept. of Agric., Plant Div. May 14, 2002.

2. Deny the Monsanto/Scotts Creeping Bentgrass Petition Seeking Deregulated Status.

Regulatory authority.

7 CFR 340.6 - Petition for determination of nonregulated status, provides:

(a) General. Any person may submit to the Administrator, a petition to seek a determination that an article should not be regulated under this part.

The regulation includes extensive requirements for such petitions, and then provides:

(3) The Administrator shall, based upon available information, furnish a response to each petitioner within 180 days of receipt of a completed petition. The response will either: (i) Approve the petition in whole or in part; or (ii) deny the petition.

Argument.

The arguments and evidence in opposition to the petition for deregulated status submitted by Monsanto/Scotts for GE glyphosate tolerant creeping bentgrass are the same as the arguments and evidence for listing GE glyphosate resistant creeping bentgrass as a noxious weed in Section 1, above, which are incorporated herein by reference.

Granting deregulated status allows the 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. Given the potential impacts discussed in the previous sections, it is clear that granting the Monsanto/Scotts petition would be arbitrary and capricious and an abuse of discretion in violation of the Plant Protection Act.

Requested Action 2:

Deny the petition for deregulated status submitted by Monsanto/Scotts for GE glyphosate tolerant creeping bentgrass, No. 02-122-01p.

3. Improve National Environmental Policy Act Compliance for GE Grass Proposals.

(Note: Requested Action 2, above, urges APHIS to deny the Monsanto/Scotts deregulation proposal outright. The rest of this Petition assumes, *arguendo*, that APHIS may continue to consider that

proposal and perhaps other proposals to commercialize GE turfgrasses in the future.)

The National Environmental Policy Act (NEPA) is the cross-cutting statute that requires environmental impact assessments for all discretionary, non-excluded Federal agency actions.[28] 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 . . .."[29] 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 applicable to novel GE grass proposals include (emphasis added):

> - *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.*[30]

According to Court decisions, the "presence of one or more of these factors should result in an agency decision to prepare an EIS."[31] The presence here of scientific controversy, unique risks, potential irreversibility and the precedent-setting nature of this first ever GE turfgrass commercialization proposal plainly establish the potential for "significant" impacts, mandating a decision under NEPA to prepare a full EIS.

The EIS process is very constructive as it fleshes out alternative approaches, increases interdisciplinary and interagency advice and provides opportunities for public and outside expert input. The importance of outside input cannot be overstated. As indicated in the cover letter from TNC to Dr. White in Appendix B, APHIS's biotechnology section frankly admitted that it was unable to marshal the necessary expertise in-house to determine whether the scientific literature included

---

[28] 42 USC § 4321 *et seq*.

[29] 42 USC § 4332(C).

[30] 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).

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

references to the weediness of bentgrass, even after being asked for the information by the White House.[32] TNC personnel provided Dr. White and APHIS extensive literature citations, including seven peer-reviewed publications - one in *Science* - and five references from standard botanical manuals, plus abundant unpublished but readily accessible evidence. An EIS process would allow for further expert input beyond TNC's.[33]

The Department of Agriculture and APHIS themselves stirred the controversy on the potential environmental impacts of GE creeping bentgrass. At the same time that APHIS was professing ignorance of the science on such impacts, USDA was suppressing a high-level study on the environmental regulation of such impacts. Petitioners here refer to the CEQ/OSTP "Case Studies of Environmental Regulation for Biotechnology," referenced above (excerpted in Appendix C). According to former Department of Interior Science Advisor William Y. Brown, Ph.D., who was one of the originators of this interagency effort, the CEQ/OSTP report was to address GE creeping bentgrass, but:[34]

> *Agriculture objected to the creeping bentgrass sidebar prepared by Interior, arguing that various concerns expressed in the paper were overstated.*

According to Dr. Brown, the creeping bentgrass sidebar was the only one out of ten case studies that was never published. A review of the draft study indicates that the Department of Interior's environmental impact concerns indeed were well-supported with factual evidence. Nevertheless, USDA quashed it saying the environmental concerns were "overstated," again at the same time APHIS was claiming ignorance and asking TNC for additional weed science information. None of this sequence - professing scientific ignorance at the same time the agency argues the concerns are

---

[32] Appendix B, cover letter from Marilyn Jordan, Ph.D., Stewardship Ecologist, TNC, to Dr. James L. White, Senior Operations Officer, APHIS biotechnology section, reporting Dr. White's March 7, 2001, statement: "If you have any peer reviewed citations that list bentgrass as a serious or common weed, we'd would (sic) appreciate them because although this has been repeated (sic) stated in the public discussion we and Interior Dept. was (sic) unable to provide these for a recent White House review of biotech products."

[33] While Petitioners agree TNC has expertise and agree with TNC's call for a moratorium, we observe that TNC, in Appendix B, due to its focus on natural areas and ecological risks, understates the economic risks posed by weedy GE creeping bentgrass to conventional turfgrass plantations, and its potential impacts on conventional residential and commercial lawns, athletic fields and other interests, documented elsewhere in this Petition.

[34] Brown, W.Y. 2001. Promise and peril. *The Environmental Forum* (Environmental Law Inst.), vol. 18, no. 5, Sept.-Oct., pp. 30-38.

overstated - makes sense, except that it appears that USDA has a bias to downplay the potential impacts of GE products. Certainly, the factors of **controversy** and **uncertainty** regarding the impacts mentioned in the CEQ NEPA regulations, above, exist here such that an EIS is required under the CEQ regulations.

Reinforcing the apparent bias problem, APHIS's NEPA regulation for permitting releases of GE species, 7 CFR § 372.5(b)(4)(b), provides (emphasis added):

> *372.5 Classification of actions....(b) Actions normally requiring environmental assessments but not necessarily environmental impact statements. This class of APHIS actions may involve the agency as a whole or an entire program, but generally is related to a more discrete program component and is characterized by its limited scope (particular sites, species, or activities) and potential effect (impacting relatively few environmental values or systems)....Actions in this class include:....(4) Approvals and issuance of permits for proposals involving* ***genetically engineered*** *or nonindigenous species, except for actions that are categorically excluded, as provided in paragraph (c) of this section.*

This provision that a shorter, simpler environmental assessment (EA) normally will suffice rather than a full EIS amounts to a presumption that the impacts of a GE product release will not be "significant" and that a Finding of No Significant Impact (FONSI) should result. Sec. 372.5 is absurd on its face when applied to a broad action like deregulating a fertile, weedy GE consumer product; the regulation just presumes that the effects will "*impact[] relatively few environmental values or systems*." The regulation's built-in presumption contravenes the purpose of NEPA and contravenes the CEQ's NEPA regulations by minimizing the analysis required for controversial, precedent-setting GE introductions that may pose potentially significant impacts.

Especially for GE turfgrasses that are known weeds, the presumption should be that normally a full EIS will be required. Yet, 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. Several commenters have criticized the quality of APHIS's crop-by-crop EAs. Those criticisms raise the most alarm for the EAs on sweeping deregulation petitions, such as is proposed here by Monsanto/Scotts. 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.*[35]

---

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

This bland assertion presents a stunning indictment of APHIS's NEPA work, indicating the agency is using "quick and dirty" EA's looking at small spatial scales in lieu of full EIS's 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.[36] Recall that TNC identified 23 discrete habitat types in which *A. stolonifera* and/or *P. pratensis* already have invaded. The fact that it will be tremendously difficult to predict the impact that making these species glyphosate resistant will have across those 23 habitat types means that the highest level of NEPA analysis is called for.

On the positive side, APHIS recently committed to prepare a full EIS prior to the step of allowing any unconfined field release of a proposed biological control agent, the sterile GE pink bollworm, which may eventually be suitable for use in cotton-growing areas in central Arizona and the San Joaquin Valley in California.[37] This step is far short of approving deregulated status. Few, if any, biologists could sensibly argue that the broad unmonitored release and sale of an invasive, fully fertile, Roundup-resistant turfgrass throughout the vast wholesale and retail markets - for homeowners, commercial property, government property, golf courses, landscapers and so on - would pose less significant impacts than the limited field release of a GE cotton pest that is sterile and monitored by an expert USDA research institute. **Any decision to forego a full EIS for the clearly significant deregulation and commercialization of fertile GE turfgrasses after APHIS has required a full EIS prior to field trials of the sterile GE pink bollworm would be patently arbitrary and capricious.**

Requested Action 3:

i. Commit to preparing a full EIS on the Monsanto/Scotts proposal to commercialize GE creeping bentgrass.

189.

[36] See also the statement of Janice C. Schach, ASLA President, in support of the ASLA/FET moratorium request to APHIS in Appendix A: "We are highly concerned with the use of genetically modified plants because they could potentially affect the whole ecosystem of native plants," quoted in D. Barboza. 2000. Suburban genetics: scientists searching for a perfect lawn. *New York Times*, July 8.

[37] 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.

ii. Promulgate a new NEPA implementing regulation amending 7 CFR § 372.5 to eliminate the presumption that an EA normally will suffice rather than a full EIS in order to analyze the proposed deregulation of a GE species.

4. Commit to Formal Endangered Species Act Compliance.

Under the Endangered Species Act (ESA), all Federal agencies have the duty to avoid actions that jeopardize vulnerable native species of plants and animals.[38] Sec. 7 of the ESA provides, in pertinent part:

> *Interagency cooperation.*
>
> *(a) Federal agency actions and consultations.... (2) Each Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency (hereinafter in this section referred to as an "agency action") is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with affected States, to be critical.... In fulfilling the requirements of this paragraph each agency shall use the best scientific and commercial data available. (3)... a Federal agency shall consult with the Secretary on any prospective agency action at the request of, and in cooperation with, the prospective permit or license applicant if the applicant has reason to believe that an endangered species or a threatened species may be present in the area affected by his project and that implementation of such action will likely affect such species. (4) Each Federal agency shall confer with the Secretary on any agency action which is likely to jeopardize the continued existence of any species proposed to be listed under section 1533 of this title or result in the destruction or adverse modification of critical habitat proposed to be designated for such species....*

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) or the National Marine Fisheries Service (NMFS) with respect to threatened and endangered (T/E) species for all the projects that it carries out, funds or approves.

If an APHIS regulatory action may affect listed T/E species or their critical habitats, then the agency

[38] 16 USC § 1531 *et seq*.

must engage in a formal consultation and obtain a biological opinion, typically from the USFWS.[39] 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.[40] 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 biological opinion must seek to identify reasonable and prudent alternatives.[41]

More than 500 native U.S. animals and more than 735 native U.S. plants are listed as T/E species; and many of these have designated or proposed critical habitats.[42] 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* and *P. pratensis* referenced in Appendix B 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 (Appendix B, pp. 3-5.). 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 area that invasive GE varieties of these turfgrasses may affect.

APHIS must take the duty to consult seriously for each GE turfgrass project it considers and document that it has done so. A commitment by APHIS to undertake formal Sec. 7 consultation for all of its regulatory and programmatic actions with respect to GE turfgrasses would greatly increase the confidence of the scientific and conservation communities.

The National Park Service's (NPS) scientists also list these turfgrass species as invasive weeds, as indicated in the Noxious Weed Petition herein, under Evidence A, above.[43] 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.

Requested Action 4:

---

[39] 16 USC § 1536(b).

[40] 50 CFR § 402.14(d).

[41] 16 USC § 1536(b)(3)(A).

[42] USFWS. 2001. *Endangered Species Bulletin,* vol. XXVI, no. 1, p. 40.

[43] Website at www.nps.gov/plants/alien/list/a.htm .

i. Issue a policy directive committing APHIS to consult formally with the USFWS under ESA Sec. 7 regarding the potential effect on listed T/E species and their designated critical habitats for each proposed field release and deregulation proposal for a GE turfgrass.

ii. Pursue memorandums of understanding to obtain the early involvement of the USFWS, the NPS and other affected land management agencies with respect to conservation issues presented by GE herbicide resistant turfgrass release proposals.

5. Comply with Executive Order 13112 on Invasive Species.

An important duty rests with Federal agencies to avoid the introduction of harmful invasive species (whether GE or non-GE), under Executive Order (EO)13112 of February 3, 1999, on Invasive Species. This EO, still in effect, provides in pertinent part:

> *Sec. 2. Federal Agency Duties.*
>
> *(a) Each Federal agency whose actions may affect the status of invasive species shall, to the extent practicable and permitted by law,*
>
> *(1) identify such actions;*
>
> *(2) subject to the availability of appropriations, and within Administration budgetary limits, use relevant programs and authorities to: (i) prevent the introduction of invasive species;....*
>
> *(3) not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless, pursuant to guidelines that it has prescribed, the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions.*

APHIS now is considering whether to "authorize, fund, or carry out actions" that may deregulate a new GE invasive species or "may affect the status" of existing invasive species. First, as indicated above, ample indications exist that engineering herbicide resistance into an **already invasive,** readily out-crossing, turfgrass will increase the potential invasiveness of both it and its nearby weedy relatives. Secondly, the very purpose of glyphosate resistant turfgrass is to improve control of other invasive turfgrass weeds by allowing broader use of glyphosate, which will not damage the GE grass itself.

In short, approving the introduction and commercialization of GE creeping bentgrass undoubtedly will "affect the status" of it, its weedy relatives and other invasives as well. Therefore, EO 13112

requires APHIS to first promulgate decisionmaking guidelines, which it does not now have, to ensure that the "benefits of such action clearly outweigh the potential harm".[44]

Requested Action 5:

Comply with Sec. 2 of EO 13112 by adopting appropriate guidelines addressing the benefits and harms, and ways to minimize the harms, for all APHIS actions that "authorize, fund, or carry out actions" that may result in introduction of new invasive turfgrasses or that "may affect the status" of existing turfgrass weeds.

CONCLUSION

APHIS is poised to make one of the most important decisions on a GE species the agency has ever made, based on the high potential for GE glyphosate resistant turfgrasses to invade and genetically contaminate so many native and domesticated species across such diverse landscapes, and to cause environmental and economic damage. The wholesale and retail markets for these GE lawn products would amount to **tens of millions** of potential purchasers just in the United States, many times more direct purchasers than any existing GE product. No hope will exist for effective recalls if APHIS makes the wrong decisions. The irreversible effect of granting deregulated status means APHIS has only one chance to "get this one right." Remarkably strong scientific evidence establishes that the right actions are those that Petitioners have sought above, specifically:

Requested Action 1:

Promptly approve this Petition to list novel GE varieties of creeping bentgrass (GE glyphosate resistant *Agrostis stolonifera)* and Kentucky bluegrass (GE glyphosate resistant *Poa pratensis*) as noxious weeds under 7 CFR 360.

Requested Action 2:

Deny the petition for deregulated status submitted by Monsanto/Scotts for GE glyphosate tolerant creeping bentgrass, No. 02-122-01p.

Requested Action 3:

---

[44] An EO adopted pursuant to statutory or constitutional authority, as EO 13112 was (see Preamble section therein for statutory authority) has the force and effect of law for Federal agencies. Legal Aid Society of Alameda County vs. Brenner, 381 FSupp 125 (DC Cal. 1975).

i. Commit to preparing a full EIS on the Monsanto/Scotts proposal to commercialize GE creeping bentgrass.

ii. Promulgate a new NEPA implementing regulation amending 7 CFR § 372.5 to eliminate the presumption that an EA normally will suffice rather than a full EIS in order to analyze the proposed deregulation of a GE species.

Requested Action 4:

i. Issue a policy directive committing APHIS to consult formally with the USFWS under ESA Sec. 7 regarding the potential effect on listed T/E species and their designated critical habitats for each proposed field release and deregulation proposal for a GE turfgrass.

ii. Pursue memorandums of understanding to obtain the early involvement of the USFWS, the NPS and other affected land management agencies with respect to conservation issues presented by GE herbicide resistant turfgrass release proposals.

Requested Action 5:

Comply with Sec. 2 of EO 13112 by adopting appropriate guidelines addressing the benefits and harms, and ways to minimize the harms, for all APHIS actions that "authorize, fund, or carry out actions" that may result in introduction of new invasive turfgrasses or that "may affect the status" of existing turfgrass weeds.

Petitioners look forward to your earliest formal responses to each of these Requested Actions, and ask for the opportunity to discuss them personally. Please promptly publish notice of this Petition in the Federal Register and create a formal open docket for it, or otherwise assign an identification number and communicate that to us. For further information, please contact Peter T. Jenkins, CTA/CFS Attorney/Policy Analyst, at 202.547.9359 ext. 13, or email: peterjenkins@icta.org.

Respectfully submitted,

_____
Andrew Kimbrell
Executive Director

_____
Joseph Mendelson, III
Legal Director

_____
Peter T. Jenkins
Attorney/Policy Analyst

International Center for Technology Assessment and Center for Food Safety
660 Pennsylvania Ave. SE, Suite 302
Washington, DC 20003

APPENDICES

APPENDIX A. ASLA/FET moratorium request letter of July 7, 2000, to Craig A. Reed, APHIS.
APPENDIX B. TNC moratorium request letter to James White, APHIS, and supporting scientific report.
APPENDIX C. Excerpts of CEQ/OSTP draft case study sidebar on herbicide-tolerant creeping bentgrass.
APPENDIX D. Gene flow from transgenic creeping bentgrass, Wipff/Fricker report to ODA, 2001.