Mr Braulio Ferreira de Souza Dias
Executive Secretary
Convention on Biological Diversity

secretariat@cbd.int

19th March 2013

Dear Mr Dias,

Request for intervention on GMOs likely to have adverse effects on the conservation and sustainable use of biological diversity; GM soybean tolerant to 2,4-D, glufosinate and glyphosate (DAS-44406-6).

This request is submitted by: the African Centre for Biosafety, the Network for a GM Free Latin America, the Pesticide Action Network, North America, GRAIN, Aquí el logo de la Red Nacional de Acción Ecologista (RENACE), Terra de Direitos and AS-PTA Agricultura Familiar e Agroecologia.

The African Centre for Biosafety (ACB) is a non-profit organisation, based in Johannesburg, South Africa. It has a respected record of evidence-based work in contributing to the GMO decision-making process; and protecting genetic diversity, traditional knowledge and seed sovereignty, built upon the values of equal access to and use of resources and support for the growing agro-ecological farming movement.[1]

The Network for a GE Free Latin America (Red por una América Latina Libre de Transgénicos (RALLT), was formed in 1999 by several peasants, environmental and human rights organizations to halt the expansion of genetically modified (GM) crops in Latin America and its adverse impacts on human health, food and farming systems, food sovereignty and the environment.[2]

Pesticide Action Network, North America (PANNA) works to replace the use of hazardous pesticides with ecologically sound and socially just alternatives. As one of five PAN Regional Centers worldwide, it links local and international consumer, labour, health, environment and agriculture groups into an international citizens' action network. For 30 years, the network has

[1] See, http://www.acbio.org.za
[2] See, www.rallt.org

defended basic rights to health, livelihood and environmental quality.[3]

GRAIN is an international, non-profit organisation that works to support small farmers and social movements in their struggles for community-controlled and biodiversity-based food systems.[4]

Red Nacional de Acción Ecologista (RENACE), is a national network in Argentina working on social and environmental issues.[5]

Terra de Direitos is a Human Rights Organization based in Brazil, acting in defense and promotion of human rights, mainly the economic, social cultural and environmental rights. The Organization works ensuring the right of farmers and traditional people to free usage of biodiversity and the recognition of traditional knowledge, enabling the free usage of genetic resources for food and for food and for the conservation of agrobiodiversity.[6]

AS-PTA Family Farming and Agroecology is a Non- Governmental, Not-For-Profit organization created in 1983 whose mission is to foster the transformation of the Brazilian agriculture into a new development model based on family farmers and on the use of the agroecological approach to agricultural production[7].

Background

Dow Agroscience's GM soybean variety DAS-44406-6 has been genetically modified to be tolerant to herbicides based on 2,4-D, glufosinate ammonium and glyphosate. It is the only GMO currently pending approval that is tolerant to this combination of herbicides[1], and thus sets a dangerous precedent. The drive to develop GMOs tolerant to herbicides other than glyphosate stems in large part from the rapid spread of glyphosate resistant weeds in the United States. Given the relatively short space of time in which this has happened, it is not fanciful to suggest that the same issue could soon confront 2,4-D and glufosinate (in addition to a number of other chemically tolerant GMOs in the pipeline such as Dicamba).

In addition to DAS-44406-6, Dow Chemical has also developed a GM maize variety tolerant to 2,4-D and glufosinate (DAS-40278-9) and a GM soybean variety also tolerant to 2,4-D and glufosinate (DAS-68416-4). The company has already applied for the commercial cultivation of these three varieties in Brazil. According to the National Technical Biosafety Commission's – CTNBio - agenda they are ready or almost ready to be voted[2].

[3] See, http://www.panna.org
[4] See, http://www.grain.org
[5] See, http://www.renace.net
[6] See, http://terradedireitos.org.br/
[7] See, http://aspta.org.br

Status of approvals of DAS-44406-6

Dow has sought approval for commercial cultivation of DAS-44406-6 in the United States, Argentina,[3] Brazil[4] and Canada, and for import approval in Australia / New Zealand,[5] Canada, the European Union, Japan, South Africa, South Korea and Uruguay. At the time of writing the only confirmed approvals we are aware of are in Australia / New Zealand[6], Japan[7] and South Africa.

The approval for import of DAS-44406-6 in South Africa is all the more galling as, in response to intense pressure from civil society and the scientific community, there is currently a motion before the South African Parliament to have a previous decision on the approval of Dow's 2,4-D tolerant GM maize variety (DAS-40278-9) overturned.[8] The decision also appears to go against an apparently precautionary stance taken by South African biosafety regulators in response to Dow's application for import approval of another GM soybean variety, DAS-68416-4 (tolerant to 2,4-D and glufosinate).

About 2,4-D, glufosinate and glyphosate

2,4-D

The chemical, 2,4-D, was one of the active ingredients present in the now infamous 'Agent-Orange' chemical defoliant, used to devastating effect by the US military during the Vietnam War. The herbicide 2,4-D was part of the security research for use as a chemical weapon during World War II.[9] Although the main health effects of Agent Orange were blamed on the other component of the mixture (2,4,5-T) and dioxin contamination, the data indicates that 2,4-D has significant health risks of its own. It remains unclear whether continuing low-level contamination of 2,4-D with dioxins or dioxin-like compounds plays a role.

The herbicide 2,4-D is included among the 'hormone herbicides', as it is meant to behave like the natural hormone, auxin, or indole-3-acetic acid (IAA). Plants naturally produce hormones, which are chemicals that perform precisely, and in very small quantities. Their concentrations are regulated internally by the plant, as in the case of naturally-produced auxin – a hormone that regulates the healthy plant growth and development. However, in its synthetic form it is produced at much higher concentrations that kill the plant in the absence of internal control and regulatory mechanisms.

The chemical 2,4-D is a systemic herbicide because it is absorbed through the leaves or roots and transported by the lymph throughout the body and internal tissues of the plant, reaching unsprayed parts. It accumulates in the growth regions and induces malformations that kill the plant. It is considered as one of the first 'selective' herbicides for killing broadleaf plants and controlling weeds in annual and perennial, cereal crops, sugar cane, pasture, industrial areas and lawns, home gardens and golf courses.

Glufosinate

Glufosinate is a broad spectrum herbicide. Though it has been used in relatively small quantities since the 1980s, the advent of GM glufosinate tolerant crops has increased its use significantly.[10]

Glyphosate

Glyphosate is one of the world's most ubiquitous agro-chemicals, accounting for approximately 25% of the global herbicide market. It is a broad spectrum herbicide that works by inhibiting the enzyme enolpyruvylshikimate-phosphate-synthase (EPSPS), which is a catalyst for the production of three essential amino acids: phenylalanine, tyrosine, and tryptophan.[11]

GMOs and increases in pesticide use

The introduction of GM herbicide tolerant crops has led to dramatic increases in pesticide use wherever these crops are cultivated. In the United States, between 1996 (when HT crops were introduced) and 2011, Herbicide-tolerant (HT) crops were responsible for an overall increase of pesticide use of 239 million kgs.[12] Between 1996 and 2011 the amount of glyphosate used in Argentina increased 11 fold, to 237 million litres. In Brazil the volume of pesticides sold increased by 360% between 2000 and 2009. In Bolivia, from 2004 – 2008 the volume of glyphosate and 2,4-D used increased by factors of 3.5 and 3.3 respectively. For Atrazine and Paraquat the figures were 4.5 and 2.3 respectively. GM soybean was approved in Bolivia in 2004.[13] In South Africa, between 2005 and 2012 the overall use of glyphosate in the country increased from 12 million to 20 million litres (while glyphosate imports increased by 177% during the period).[14]

The new generation GM herbicide-tolerant crops – industry's response to the 'super-weed' epidemic

Millions of hectares of GM crops grown in the US, Brazil and Argentina are genetically engineered (GE) to resist glyphosate. These crops have, particularly in the US, become infested with glyphosate-resistant 'superweeds'. In other words, the GMOs and the glyphosate are not only failing, they are causing havoc in farmers' fields. Such weed resistance is potentially threatening the viability of the biotechnology industry's glyphosate-tolerant crops. These crops, which are synonymous with Monsanto's 'Roundup Ready' brand, account for 85 per cent of all GM crops grown worldwide.[15]

In response to the superweed epidemic, a new generation of GM crops resistant to older and even more toxic herbicides are now being introduced. These include Dow's 2,4-D-resistant corn and soybean; Monsanto's GM crops resistant to dicamba, a herbicide very similar to 2,4-D; Bayer's isoxaflutole-resistant soybean; BASF's imidazolinone-resistant soybean; DuPont's maize and soybeans resistant to ALS inhibitors and so forth. Indeed, 14 of the 20 GM crops currently pending approval in the US are all herbicide-resistant, some to three herbicides: 2,4-D, glyphosate and glufosinate.[16]

Risk to the conservation and sustainable use of biological diversity posed by 2,4-D, glufosinate and glyphosate

2,4-D

2,4-D is a volatile herbicide that is known to drift beyond the field of application to damage neighbouring crops and wild plants, both directly and through volatilisation. 2,4-D vapour injures most broadleaf plants at extremely low levels, as low as three-billionths of a gram per litre for air. Grapes, tomatoes, cotton, soybean, sunflower and lettuce are known to be particularly vulnerable to 2.4-D drift. Two surveys of state pesticide regulators establish that 2,4-D drift is already responsible for more episodes of crop injury than any other pesticide.[17]

If GM 2,4-D crops are to be adopted, the increase in the use of herbicide 2,4-D may increase 30 times by the end of the decade, according to expert estimates.[18] In US agriculture alone, for example, the use of 2,4-D in corn will likely increase from 27 million to 100 million pounds. Exposure to this drift-prone herbicide—and resulting harms to human health, non-target organisms and non-resistant crops—will thus dramatically increase if GM 2,4-D crops are approved and planted.

Glufosinate

Glufosinate is moderately persistent in some soils, and has the potential to leach to groundwater, especially in sandy soils. Despite being a herbicide it also has insecticidal properties. The Swedish National Chemicals Inspectorate (KEMI) has noted that glufosinate is toxic to aquatic organisms and may cause long-term adverse effects in the aquatic environment and is highly toxic to beneficial insects. KEMI has also noted that there may be a long-term risk to bird populations where glufosinate is used in genetically modified crops. Studies from 12 agricultural and 10 forest soils in Canada found that glufosinate selectively reduced the number of fungi and bacteria in soils.[19]

In 1999 the UK government tasked an independent consortium of researchers to investigate the impacts of GM herbicide tolerant crops on the biodiversity of Britain's farms. At the time it was the largest and most thorough study of its kind in the world; 266 trial sites across England, Scotland and Wales were chosen, which lasted for five years. Four crops were chosen: herbicide tolerant sugar-beet, maize, and winter and spring sown oilseed rape (OSR / canola). The HT maize, winter and spring sowed OSR were all tolerant to glufosinate.[20]

Glyphosate

There is a large body of work that has now been done on the environmental impacts of glyphosate. Below is a summary of some of the key findings:

- Research analyzing the impact of Roundup formulations and glyphosate itself, has shown it to have an inhibitory effect on microbial growth at lower concentrations than

those recommended in agriculture. The toxic effect of glyphosate was amplified by its formulation adjuvants.[21]

- Various studies have found glyphosate to: impair water intake and use efficiency, and biomass production in plants[22]; interfere with the uptake of calcium, magnesium, iron and manganese in non HT soybeans[23]; and contribute significantly to incidences of fungal disease.[24]

- Glyphosate weed control programmes have been linked to increased incidences of over thirty plant diseases, in crops as diverse as apples, barley, canola, citrus, cotton, soybeans, tomatoes and wheat.[25]

- Greenhouse studies have shown that glyphosate interferes with iron uptake even in glyphosate tolerant soybean plants.[26] A three year field study in the USA indicated that, at rates of 2.52kg/ha, glyphosate inhibits nitrogen fixation and or simulation in glyphosate resistant soybeans.[27]

- In greenhouse and growth chamber experiments, conventional and glyphosate tolerant soybeans were treated with glyphosate doses of 0.28 kg/ha, 1.12 kg/ha and 2.24 kg/ha. A dose of 2.24kg/ha reduced the dry shoot and root weight of glyphosate tolerant soybeans by 25-30%. A repeated dosage reduced root growth, and reduced the nodule number by between 30% and 39%.[28]

- Glyphosate is toxic to earthworms.[29]

Glyphosate's impact on plant (weed) diversity in areas it is used has knock-on effects further up the food-chain: The rapid spread of GM HT crops in the USA has contributed significantly to 'the potential collapse' of the 'unique migration and overwintering biology of the eastern North American monarch butterfly'.[30]

Combinatorial effects of multiple herbicides

The rationale behind the development of DAS-44406-6 is to pro-long the efficacy (and therefore commercial viability) of GM herbicide tolerant crops and their associated herbicides. DAS-44406-6 is unique in that, at the time of writing at least, it is the only GM crop tolerant to 2,4-D, glufosinate ammonium and glyphosate that is pending approval for commercial cultivation.

Above we have catalogued a large body of studies that link 2,4-D, glufosinate and glyphosate based herbicides with adverse effects to the conservation and sustainable use of biological diversity. We are not aware of any independent studies that have investigated the combinatorial effects of 2,4-D, glufosinate and glyphosate in the environment. This is a notable gap in risk assessment knowledge given the large doses of these herbicides used in combination DAS-44406-6 will result in.

It should also be noted that a recent study revealed polyethoxylated tallowamine (POE-15), an 'adjuvant', and not glyphosate itself, to be the most toxic substance in glyphosate based

herbicides. [31] The implications of this finding for the environmental and human health risks posed by DAS-44406-6 are startling, given the potential combination of unknown quantities of adjuvants in the three herbicide groups, and their active ingredients.

As previously stated, GMOs tolerant to multiple herbicides are a response to weeds developing resistance to single herbicide groups, particularly glyphosate at the present time. GM crops that are 'insect resistant', that is that produce their own toxins, are experiencing similar constraints.[32] The biotechnology industry's response to insect resistance has followed the same logic as their approach to weed resistance; to combine more insect resistant genes in their seeds. In 2010 Monsanto released a GM maize variety, 'Smartstax' that has eight inserted transgenes; 6 inferring insect resistance and 2 inferring herbicide tolerance (to glyphosate and glufosinate).[33] Given the pace with which glyphosate resistant weeds have developed, and the inevitable development of resistance to glufosinate and 2,4-D that will follow the widespread adoption of GM crops such as DAS-44406-6, how long will it be before the biotechnology developers will be presenting GM crops resistant to combinations of 4,5 or even 6 chemical herbicides?

Citizen action against 2,4-D GM crops

Several actions have already been taken by civil society organisations to reject the possible approval/deregulation of 2,4-D-resistant transgenic crops. In the USA, around 370 000 people – ranging from health practitioners to farmers – and 170 civil society organisations, signed a letter addressed to the USDA rejecting a possible deregulation of 2,4-D tolerant crops.[34] A group of medical doctors and health practitioners sent a letter to the USDA Secretary urging him to deny Dow's petition to deregulate 2,4-D-resistant corn.[35] Additionally, the organisation 'Save Our Crops Coalition' sent a submission to APHIS in relation to a possible deregulation of the 2,4-D tolerant corn.[36]

The Movement of Small Farmers (MPA) from Brazil, part of La Vía Campesina, convened a mass meeting in the Santa Catarina state, on the potential dangers of 2,4-D-resistant crops, and described them as a lethal threat to the health of farmers, consumers and the environment.

The African Centre for Biosafety (ACB) has, with the support of more than 7,500 individuals, 18 health professionals and 20 organisations from South Africa, petitioned the Parliament of South Africa to ban Dow's 2,4-D GM maize. We are of the view that such similar support exists to reject Dow's application to import its GM 2,4-D and glufosinate-resistant soybean into SA (DAS-6816-4). Ms C Dudley, MP, submitted the petition to Parliament from the African Christian Democratic Party, on 7 August 2012.[37] The petition was tabled in Parliament on the 15 August 2012, and has been submitted to the Portfolio Committee on Agriculture, Forestry and Fisheries for consideration and report back to Parliament.[38]

In Brazil, the campaign 'Brazil Organic and GMO-Free and Agrochemicals' and the 'Campaign Against Pesticides and for Life' has denounced the propaganda used by biotechnology companies that GM crops would reduce pesticide use. This strategy of the biotechnology

industry served to hook farmers into using a 'technology package', resulting in Brazil being the world's largest consumer of pesticides since 2008, and the second largest producer of GM crops by acreage, with huge negative impacts on health and the environment.

Alternatives to GM based agriculture

In concluding, we respectfully draw your kind attention to the findings of the landmark UN-led study, the International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD), which is the most comprehensive review of global agriculture ever undertaken. Its findings were approved in 2008 by the overwhelming majority (95 per cent) of governments attending the final intergovernmental plenary in Johannesburg.

The IAASTD, which was sponsored by four United Nations agencies, the World Bank and the Global Environmental Facility, was a three-year study involving more than 400 experts from over 80 countries. In short, it is the most comprehensive assessment of global agriculture that has ever been undertaken.

In general, the IAASTD found little evidence to support a conclusion that modern biotechnologies are well suited to meeting the needs of small-scale and subsistence farmers, particularly under the increasingly unpredictable environmental and economic conditions that they face. It further found that 'modern biotechnology and its products have not reliably increased yields of crops', that GM crops did not necessarily lead to reductions in pesticide use, and have, particularly in South America, "had a negative impact on biodiversity due to the conversion of forest areas and natural savannahs to transgenic plantations, in particular soybean". Where GM crops, agro-chemicals and mechanisation have been introduced, social cohesion has been affected, as these methods have primarily benefited the better-resourced groups in society and transnational corporations, rather than the most vulnerable ones.'[39]

The IAASDT called for a re-orientation of policy towards greater social equity and environmental sustainability, and made the following recommendations:

- Greater support for small-scale farmers', women's, indigenous and community-based organisations, and investment in rural areas;
- Ensure farmers have access to land, seeds, water information, credit and marketing infrastructure;
- Build capacity in participatory agro-ecological research, extension and education and in bio-diverse, ecologically resilient farming practices to cope with increasing environmental stress;
- Recognise the rights of farmers and independent researchers to save, exchange and cultivate seed;
- Greater regulation at the global, regional and local levels to prevent corporate concentration in the food and agricultural industries, and to ensure equitable access to food and decision-making mechanisms for all groups in society; and
- Referring specifically to GMOs, the IAASTD called for more transparency and public participation in biotechnology debates, long-term environmental and health

monitoring assessment, greater use of the Precautionary Approach in decision-making, and limiting the cultivation of GM plants in regions where wild relatives occur.

The IAASTD's calls have been echoed more recently by the UN Special Rapporteur on the right to food, Olivier De Schutter. In a special report submitted to the UN General Assembly in late 2010, Mr de Schutter, in addition to the recommendations above, pointed out that agro-ecology, as well as resulting in more equitable social relations in rural areas, can lead to production increases, particularly for resource poor, small-scale farmers. Citing research by Jules Pretty et al., de Schutter pointed out that in 286 sustainable agricultural projects across 57 developing countries the average yield increase on farms where such projects had been carried out was 79 per cent. After the UN Conference on Trade and Development (UNCTAD) and UN Environment Programme (UNEP) reanalysed the data to look solely at African projects, they found even higher average yield increases: 116 per cent across Africa as a whole and 128 per cent increases for projects in East Africa.[40]

Relief sought

Noting our deep concern that the commercialisation of GM maize and soybeans, genetically engineered to be resistant to the herbicide 2,4-D in countries such as Argentina, Brazil, South Africa and the US, will severely hamper efforts towards the conservation and sustainable use of biological diversity.

Further noting the work that the Convention on Biodiversity carries out towards the conservation and sustainable use of agro-biodiversity, through its Agro-biodiversity programme, we draw your attention towards Decision IX/1 of COP 9 "In-depth review of the programme of work on agricultural biodiversity" which states:

The Conference of the parties:

"Notes the significant contribution of agriculture to the conservation and sustainable use of biodiversity through demonstrated best practices in the management of agricultural biodiversity, innovation and progress in supporting sustainable agriculture, reducing the negative impacts of agriculture and in particular its positive contribution to reducing hunger and poverty, improved food security and improved human well-being."

We kindly request that you take the following actions:

Request that the governments of Argentina, Brazil, South Africa and the United States conduct a comprehensive, independent and transparent environmental assessment of both the impacts of genetically modified (GM) crops engineered to be resistant to combinations of 2,4-D, glufosinate and glyphosate, and the impacts of a likely significant increase in use of said herbicides as a direct consequence of introduction of these 2,4-D resistant crops, before any new approvals are granted for the commercial growing, importing or exporting of these crops and their products;

Recommend that such assessment be conducted by a multi-disciplinary team of experts, appointed by these governments, in consultation with the public in their respective countries in an open and transparent manner by way of public hearings;

Recommend to the governments of Argentina, Brazil, South Africa and the United States not to grant any new approvals with regard to the GM crops set out in Annex A hereto, until the assessments referred to above have been satisfactorily completed and the results made public, showing that such GM crops and the herbicides with which they are designed to be used will not undermine the conservation and sustainable use of biological diversity;

Request the government of South Africa to reverse its decisions to grant the approval for the importation for food, feed and processing, of Dow Chemical's GM maize variety, DAS-40278-9 (also known as 2,4-D GM maize), and GM soybean variety, DAS-44406-6;

Recommend to the governments of Argentina, Brazil, South Africa and the US to take immediate and appropriate measures to restore ecosystems that have been damaged or degraded as a result of the use of glyphosate or glufosinate in association with GM herbicide-tolerant crops.

Signed

Mariam Mayet, African Centre for Biosafety and Carlos Vicente, GRAIN on behalf of the ACB, GRAIN and the other organisations and signatories.

[1] See: http://www.aphis.usda.gov/biotechnology/petitions_table_pending.shtml

[2] See, http://www.ctnbio.gov.br/upd_blob/0001/1743.pdf, consulted on march 18th 2013.

[3] **Ministry of Agriculture, CONABIA,** Serie histórica de liberaciones experimentales**, 2010 and 2011,** http://64.76.123.202/site/agregado_de_valor/biotecnologia/50-EVALUACIONES/___historica/index.php

[4] Application n. 01200.003948/2012-75, CTNBio, on sept. 25th 2012.

[5] Food standards Australia New Zealand (FSANZ) is a single governing body responsible for food standards, including the regulation of GMOs, in both countries.

[6] http://www.foodstandards.gov.au/_srcfiles/A1073_AppR.pdf

[7] http://www.bch.biodic.go.jp/english/lmo_2011.html

[8] **National Assembly order paper – Tuesday, 26th February 2013.** Parliament of the Republic of South Africa.
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[16] See http://www.aphis.usda.gov/biotechnology/not_reg.html

[17] Centre for Food Safety (2012). www.centerforfoodsafety.org/wp.../04/CFS_FSR_spring_2012.pdf

[18] Benbrook, C (2012). **Projected increase in 2,4-D use with introduction of 2,4-D resistant corn through 2019.** Centre for Food Safety. http://www.centerforfoodsafety.org/projected-increase-in-24-d-use-with-introduction-of-24-d-resistant-corn-through-2019-benbrook2012/

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[34] http://www.panna.org/press-release/usda-receives-over-365000-public-comments-opposing-approval-24-d-resistant-genetically

[35] Letter to Secretary Vilsack on Docket No. APHIS-2010-0103 (Petitions, Plant Pest Risk Assessments, and Environmental Assessments; Availability: Dow AgroSciences, LLC, Corn Genetically Engineered for Herbicide Tolerance) .April 27, 2012.

[36] Comment of SOCC – Docket No. APHIS – 2010-0103.

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