uk2020

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Annual South African agricultural biotechnology industry
ISAAA media conference

Pretoria, Republic of South Africa

EMBARGOED
24 February 2015 9am GMT

FINAL DRAFT
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Introduction

Thank you all very much.

Thank you, Doctor Obokoh for that kind introduction. It's a great pleasure to be able to speak at the Annual South African agricultural biotechnology industry/ISAAA media conference. You are all doing so much important - indeed life-saving - work to bring the benefits of modern agricultural technology to this continent.

This is a time of extraordinary opportunity for Africa. Progress in the plant sciences is opening up the promise of a second Green Revolution, one that can not only feed the 9 to 10 billion people that will inhabit our planet in 2050, but feed them well – one that can finally end the shame of the nearly one billion who still go to bed every night hungry and malnourished.

It is a revolution, powered by cutting-edge science, that can drive economic development from the bottom up. I'm talking about authentic, indigenous growth – the only kind that really takes root… that empowers individuals … that breaks the cycle of aid and dependency and can make every nation on this Earth a strong, competitive player in global economic growth.

No place on Earth holds more promise in this respect than Africa.[1] With its vast, and as yet underutilized resources of land, soil, water and sun, Africa is wonderfully situated to match or exceed the success of Brazil - a nation that agricultural development helped catapult into the front ranks of world trade - but it will only happen if African countries embrace farming systems based on modern technologies.

The Green Blob

This is also a time, however, of great mischief, in which many individuals and even governments are turning their backs on progress. It's a strange time, really, in which the privileged classes increasingly fetishize their food and seek to turn their personal preferences into policy proscriptions for the rest of us.

Not since the original Luddites smashed cotton mill machinery in early 19th century England, have we seen such an organized, fanatical antagonism to progress and science. These enemies of the Green Revolution call themselves "progressive," but their agenda could hardly be more backward-looking and regressive.

They call themselves humanitarians and environmentalists. But their policies would condemn billions to hunger, poverty and underdevelopment. And their insistence on mandating primitive, inefficient farming techniques would decimate the Earth's remaining wild spaces, devastate species and biodiversity, and leave our natural ecology poorer as a result.

I call them the "Green Blob" – a reference to a 1950s Sci-Fi movie starring Steve McQueen in which a blob-like alien attacks Earth and swallows everything in its path: the environmental pressure groups, renewable energy companies and some public officials who keep each other well supplied with lavish funds, scare stories and green tape. This tangled triangle of unelected busybodies claims to have the interest of the planet and the countryside at heart, but it is increasingly clear that it is focusing on the wrong issues and doing real harm while profiting handsomely.

The Blob operates on two levels. First, by a pernicious grab for funding dollars with literally hundreds of them orbiting the honey pot of Europe. Secondly, with an ideological belief that Europe should abdicate its fundamental responsibility to feed its own people.

Neo-colonialism at its worst, Europe sits on some of the most fertile land on the planet, and yet imports food from the rest of the world which requires the equivalent of 35m hectares of farmland to produce.

There are many impediments standing between the vision of agricultural progress and Africa, of course, but none is more pernicious than the Blob. It is supported by massive funding provided by the EU itself,[2] as well as numerous church and humanitarian groups, and the well-meaning but misguided generosity of the privileged classes in Europe and elsewhere. It has undue influence in the media, government and international institutions. Unfortunately, few question either its credentials or motives.

I will be speaking more about the Green Blob and how we need to push back and reassert the fundamental primacy of science. But first I want to talk about the good news – and there is a lot of good news to talk about.

The Good News About Biotech

As you know, the International Service for the Acquisition of Agri-biotech Applications, ISAAA, has just come out with its latest report on the worldwide adoption of genetically modified crops. As before, it records a remarkable success story.

2014 was the 19th year of successful commercialization of biotech crops, 18 million farmers, of which 90 per cent were small and resource-poor, planted a record 181 million hectares of biotech crops in 28 countries.[3]

GMO-versions of food staples like potato in the United States and eggplant in Bangladesh have been approved for planting.

The United States continues to lead the way and saw a 5.5-fold increase in hectares of drought tolerant maize planted.

Biotech continues to be the most rapidly adopted agricultural technology in history. During the 19 years GMO crops have been commercialized, we have seen a more than 100-fold increase in the area planted.[4]

The facts also completely belie the propaganda that GMOs are only for the wealthy nations. In fact, more than 90 per cent of the farmers planting biotech are smallholder farmers in nations in the developing world.[5] For the third year in a row, less developed countries planted more biotech hectares than the entire developed world.

Farmers are famously risk-averse. They know that the misapplication of resources can spell the difference between a bumper harvest and total crop failure. That's why it's even more remarkable that nearly 100 per cent of all those farmers who plant biotech crops have yet to go back to the old ways.[6] They continue to choose to plant biotech year after year because biotech plants work. It's really that simple.

ISAAA report a number of very heartening breakthroughs.

The drought-tolerant maize technology donated to Africa by Monsanto is expected to begin commercial planting in 2017.

Field trials have been given the go-ahead in Cameroon, Egypt, Ghana, Kenya, Malawi, Nigeria and Uganda while trials have been conducted on a broad range of new crops, from biotech bananas to maize to cotton and cowpeas.[7] One can certainly hope that as the trials reveal the dramatic benefits of GMO, these countries too will make them available to all their famers.[8]

They can certainly look to the success in South Africa, which is still the leader on this continent, with 2.7 million biotech hectares planted. But they might also take in the dramatic example of insect resistant Bt cotton in Burkina Faso, where farmers are rapidly and overwhelmingly embracing the efficiencies and improved yields represented by the GMO variety.[9]

By 2013, in fact, almost 70 per cent of all cotton grown in Burkina Faso was Bt, which increased farmers' yields on average 20 per cent over non-GMO cotton. It has also dramatically decreased pesticide applications – which in Africa are often done by hand, a 40 to 80 pound backpack filled with older pesticides strapped to one's back. Bt-cotton has cut those applications from 6 to 2 or fewer and delivers a solution that is eminently more effective.[10]

Within one season, Bt can transform the life of smallholder farmers, turning their farms into profit-making enterprises that allow them to send their children to school rather than out into the fields, and to buy their families enough to eat – and of course with better nutrition comes better health.

Even where farmers have voted overwhelmingly for a choice of GM technology and the benefits have been tested and demonstrated in numerous studies, the Green Blob has been tireless in myth making and misinformation. Take the allegations of Indian farmer suicides. Anti-GM green groups stated that the introduction of GM crops had brought about an increase of suicides among

India's farmers. It is imperative in the case of such tragedy to be accurate about causes if you are to help people driven to suicide.

Professor Ian Plewis from the University of Manchester clarifies that farmer suicide rates in India are similar to the best estimates of the rates in Scotland and France, around 30 per 100,000 farmers. While these rates are still tragic, they existed at the same level prior to the introduction of GM cotton to India. He states, "In fact, the available data does not support the view that farmer suicides have increased following the introduction of Bt cotton. Taking all states together, there is evidence to support the hypothesis that the reverse is true."[11]

And in the global context, over 80 per cent of the world's cotton crop has been GM for several years. The success of insect protected GM cotton has given Burkina Faso, one of the poorest countries in the world, a new tool to boost their main economic activity: cotton production. Farmers have seen at least 66 per cent less pesticide applied, 20 per cent increase in yield, and at least $87 per hectare increase in their profit.[12]

Green Blob myths like "GM Indian Farmer Suicide" are retarding the adoption of new science in the developing world. Yet Africa is showing Europe the way.

In 2014 the 28 member states of the EU recorded 12 field trials of GM crops. This compares with 13 projects in Uganda, Kenya and Nigeria.[13] These three countries are doing more active biotech field research than the entire rich continent of Europe.

Four Anti-GMO Myths and the Truth About Biotech

Around the globe, in fact, the increasingly widespread adoption of biotech is exploding the myths of the anti-GMO campaigners. It is worth taking a moment to examine four of these myths, taking them one at a time:

Myth #1 is their recurrent implication that farmers are stupid, fooled by biotech companies into paying more for GMO seeds when they would be far better off without them. Well, I tend to think farmers have a pretty good understanding of their bottom line, and I can't imagine any farmer - in my own country or in the developing world - spending one extra dollar, euro, pound, or rand that he absolutely didn't have to spend.

As it happens, the most current and extensive research on the subject bears that out. A recent analysis of previous major studies – conducted by researchers at Germany's Göttingen University, found that globally since their introduction almost two decades ago, biotech crops have increased crop yield overall by 22 per cent, increased farmer profits by 68 per cent, and reduced chemical pesticide use by 37 per cent. They also found that these yield and profit gains are the highest in less developed countries, not the industrialised countries.[14]

In other words, the supposedly dumb farmer of Blob mythology is actually a lot smarter than the Green Blob itself.

Myth #2 is that forsaking modern agricultural technology – going organic – will benefit the environment. The opposite is actually the truth.

A few years ago, another group of researchers at Stanford University in the United States found that without the advances in agricultural technology since 1960, we would need more than twice as much land to grow all the food we produce today.[15] That's almost two billion more hectares of ploughed land than today, more than the entire landmass of Russia, the largest nation on the globe spreading over nine time zones. Two billion hectares is more than twice the entire area of the United States. The equivalent of three Amazon rain forests.[16]

I can remember as a child seeing traumatic news bulletins with images of starving people on the Indian subcontinent. The father of the Green Revolution, Norman Borlaug - "The man who fed the world" and Nobel Peace Prize Laureate in 1970 - changed that by transferring wheat with new genetics from the Americas to the Indian sub-continent in the 1960s. India is now a major food exporter.[17]

Borlaug and others harnessed innovation to completely change the way we farm. For example, it has been estimated that the production of a given quantity of a crop now requires 65 per cent less land than it did in 1961. Between 1967 and 2007 world food production increased by 115 per cent but land use only increased by eight per cent.[18] Indur Goklany has calculated that if we tried to support today's population using the production methods of the 1950s, instead of farming 38 per cent of all land, we would need to use 82 per cent.[19]

As Borlaug said, "There are 6.6 billion people on the planet today, with organic farming we could only feed 4 billion of them. Which two billion would volunteer to die?"[20]

Agriculture always needs to balance our demands for more food whilst improving the environment and biodiversity. It is clear that sustainable intensive agriculture produces more food on less land, and therefore protects wild lands for wild life, for recreation, for urban development.

There is less pressure on land that is being used for wildlife and recreation. And the whole huge area generates tourism cash and employment for local economies.

In other words, modern agriculture - with its GMOs, nitrogen fertilizer and modern pesticides - has probably done more to save natural habitat, support biodiversity, and save endangered species than all the other environmental, NGO and UN conservation activities put together.

The Keystone Alliance, a collaborative effort of industry and conservation groups in the United States, has demonstrated the environmental benefits of modern agriculture on the micro-level as well. In each of the major crops studied, inputs

of water, fertilizer and energy have been slashed and the environmental impact dramatically diminished at the same time that yields have skyrocketed.[21]

Maize yields, for instance, increased by 64 per cent in the 31 years between 1980 and 2011. Land use, however, decreased by 30 per cent, soil erosion by 67 per cent, irrigation water by 53 per cent, and energy use by 44 per cent.[22]

The revolution in no-till farming, was invented in the later 1960s a long time before GMOs. Modern herbicides and GMO crops have significantly extended its scope because farmers in many locations no longer have to plough the land to manage weeds. Tractor fuel is saved and topsoil is increasingly returning to its original structure and beneficial microorganism content and, in the United States, rivers and streams are spared the soil run-off that the EPA used to define as one of the top environmental problems in that country.[23]

And the most widely used herbicide in no-till – the glyphosate that NGOs so love to criticize – is enormously healthier for the environment and the humans and animals that live there than the chemistries it replaced. While glyphosate is indeed bad for weeds, its toxicity to animals is less than – not equivalent, but significantly less than – vinegar.[24] Something to think about next time you dress your salad.

Which brings me to Myth #3: the insistence by anti-GMO campaigners that biotech crops are somehow unsafe to eat. It's a claim they continue to hang onto in the face of many hundreds of studies testifying to GMO safety – the overwhelming majority of all the studies that have been conducted, a large number of them sponsored by governments and completely independent of industry.[25]

It's a claim they persist in despite the universal opinion of every independent scientific institution globally, (including the European Commission!) that GMOs are as safe as any other food,[26] and the fact that people in the United States have been consuming diets replete with GMOs for over 15 years now without one documented adverse health effect – not so much as a sniffle or a tummy ache.[27] Even in Europe, overwhelmingly all the animal products produced - meat, milk, cheese, eggs - come from animals fed on imported GM maize and GM soya meal. Most European farmers have, for the last almost two decades, not been permitted to grow these crops – with the one exception of a single strain of maize.[28] But European livestock farmers import millions of tons annually - without these imports currently the European livestock market would have collapsed.

In a rational world, a recent study out of the University of California Davis (one of the leading agricultural universities in the United States) would end the call for 'animal studies' of GMOs once and for all. The study compared health outcomes in over 100 billion cattle and other livestock before GMOs were introduced in 1996 and after – when quite quickly GMOs accounted for approximately 90 per cent of all animal feed. In effect, US livestock production has amounted to the largest animal feeding study ever conducted.[29]

And what was the difference in health outcomes found by the researchers? Zero. None. The animals were just as healthy after GMOs were introduced as before.

Of course, as with the other myths, the myth of GMOs' adverse health effects isn't just wrong – it's the inverse of the truth.

Generally ignored, for instance, is the widespread problem of mycotoxin contamination, often the result of insect chewing and especially boring into the growing crop, which allows the entry into the plant of fungal pathogens. The problem afflicts a wide range of foods and feed, such as maize, sorghum and peanuts.[30] Without doubt, many mycotoxins are most effectively controlled by planting GMO crops engineered with Bt insect resistance.[31]

The FAO estimates that up to half of some food crops are affected.[32] Globally, it is estimated that more than five billion people in the developing world are exposed to these naturally occurring toxins, which can suppress the immune system, retard growth and cause cancer and liver disease in both livestock and humans.[33] In Africa, the rural poor are chronically exposed to unsafe levels of these poisons. In 2003, 120 people died in Kenya after eating maize with very high aflatoxin levels.[34]

In the industrialized nations, organic growers have long sprayed with spores of the whole Bt bacterium to control for insects. This organism occurs naturally in the soil, after all, and has proved safe for mammals and humans. But when scientists engineered a plant that produced one protein found in the Bt cells as a part of its built-in defenses, the Blob fought tooth and nail to deprive the developed world of its benefits.

In a nationally funded trial conducted at the respected University of Milan, two varieties of maize were involved. Compared with conventional maize, Bt-maize not only increased yield by 28-34 per cent, but reduced the fungal toxin fumonisin from 6,000 parts per billion in the non-GMO maize to 60 parts per billion or less in the Bt-maize. The conventional maize containing over 6,000 parts per billion was unfit for human consumption under both Italian and European law. Despite the health implications, these results were shamelessly suppressed by the activist influenced Italian government which organized it.[35]

Once again, the myth is turned on its head: it's not GMOs, but the anti-GMO Green Blob that is the real danger to human health.

Myth #4 is that biotech is only good for farmers and has no consumer benefits. Once again an inverse of the truth. I count increased protection of wild lands by focusing production sustainably, and cheaper food, as being fundamentally important "consumer benefits". There are more specific examples too.

Biotechnology has already given us soybeans with higher oleic acid that don't produce cholesterol-elevating trans fats when heated.[36] Currently, a new biotech tomato is being tested that mimics good cholesterol.[37] Tomatoes are coming with

high concentrations of cancer-fighting anthocyanins.[38] Non-browning apples have recently been approved by US regulators, which should potentially greatly reduce waste through less spoilage.[39] Healthier GMO potatoes have also been approved[40] and peanuts are currently under development that lack two of the most intense allergens that pose such a danger to so many of our children.[41]

Only ten days ago, I was in Canberra and saw real progress on oilseed crops that will provide a sustainable source of long chain omega-3 fatty acids providing better nutrition to humans and farmed fish. [42,43] This could stop the obscenity of feeding huge numbers of farmed fish with wild fish.

In addition, in future, it might be possible to have the oil yields of oil palm replicated and even exceeded from GM broad acre crops that contain oil in their leaves and stems.[44] So GM developments in oil producing plants could help save vulnerable orangutan habitats encroached by palm oil plantations.

Few people know that the first biotechnology product approved for food was rennet, an enzyme used to make cheese. Today, 90 per cent of the cheeses we eat use GMO rennet because it's safer and more effective.[45] GMO-enzymes are routinely used in the production of bread, wine and beer.

All the insulin routinely used to keep diabetics alive is from GMO-bacteria. Previously insulin was produced from the pancreases of cattle and pigs. A single diabetic would require the pancreases of 50 pigs for a year's supply. Before GMO-bacteria produced insulin, one major industrial insulin producer processed eleven tons of pig's pancreases every day – from a daily slaughter of 100,000 animals.[46] Unfortunately, hugely promising GMO techniques that could protect yoghurt starter cultures from infection have been kept off the market due to fear of consumer backlash.[47]

Perhaps the most promising development, however, is biofortification, especially for the developing world, where so many lack the nutrients essential for health and well-being.

Golden Rice, Greenpeace and the Anti-Humanitarians

The flagship biofortified technology was developed 15 years ago by two German Professors Ingo Potrykus and Peter Beyer. Called Golden Rice, it is a miracle grain enhanced with vitamin-A-producing beta-carotene. In 2001 the inventors donated the technology as a potential additional intervention for vitamin A deficiency, for development and deployment by the public sector in developing countries so that it could benefit the poor of the world.[48]

Absence of a source of vitamin A in the diet, vitamin A deficiency, is the principal cause of childhood blindness globally, affecting 500,000 children annually of which half die within a year or two.[49] Vitamin A deficiency is also a nutritionally acquired immune deficiency syndrome, so common diseases which should be survivable are lethal. Two million young children die as a result every year.

So let's be clear. Although these deaths are preventable, 6,000 children alive today will be dead tomorrow. (By comparison Ebola has tragically killed about 9,000 in the last year: about 25 a day.)

Many of those millions of lives could have been saved if Golden Rice had been available in their diet, and it could have been already for several years, but for the on-going opposition of well-financed anti-GMO activist groups and their ceaseless campaign to frighten people and pressure governments to keep Golden Rice off the market.

The leader of that opposition, with a combined global war chest estimated to exceed US $500 million, has been Greenpeace, with its combination of highly sophisticated PR and un-scientific scaremongering.

Greenpeace originally claimed Golden Rice wouldn't work, but once its efficacy had been proven beyond a shadow of a doubt, they switched to saying that the poor should simply buy vitamin supplements and eat fresh vegetables instead[50] – as if families living on less than $2 a day can afford such luxuries.

But Greenpeace doesn't content itself with mere PR.

In 2013, an organization in the Philippines who lists Greenpeace amongst its partners, used a tactic that has been used all over the world by Greenpeace - violently attacking and destroying agricultural research they oppose.[51] The group, known as MASIPAG, claims to be a "farmer-led network," destroyed a field trial of Golden Rice. But local officials reported that the thugs who attacked the fields had been bused in from the city.[52]

Shamefully, Greenpeace isn't alone in its support for the MASIPAG anti-GMO eco-terrorists. MASIPAG's list of supporters reads like a directory of misguided European church and government sponsored social justice and development groups. Perhaps one should put the words "so-called" before social justice. A short list of MASIPAG's funding sources include:

- The Swiss Catholic pastoral development group known as The Fastenopfer Catholic Lenten Fund;[53]
- Misereor, the German Catholic Bishops' Organization for Development Cooperation, which receives financial support from the German government;[54]
- The Swedish Society for Nature Conservation, which is funded by the Swedish Ministry for Foreign Affairs;[55]
- Trocaire, the official development agency of the Catholic Church in Ireland, which receives funding from the Irish, UK and EU governments;[56]

It should be stressed that MASIPAG is just one of a proliferating network of anti-GMO groups and assorted activists that are operating in the developing world, often with NGO and EU support.

In 2011 Greenpeace attacked GM wheat in Australia which was part of exciting research to enhance the health benefits of this staple food crop. It was heartening to observe the very widespread backlash and condemnation by the Australian community against this criminal vandalism of trusted research. On 14 July 2011, the CSIRO Experimental Station at Ginninderra in Canberra was broken into and research plants were cut down. Some of the GM crop trial plots were partially destroyed. Greenpeace admitted liability. This incident was investigated by the Australian Federal Police and two Sydney women were charged in relation to the incident, and both women later pleaded guilty to charges of damaging Commonwealth property. On 1 August 2012, CSIRO received a reparation payment of $282,560 from Greenpeace. In November 2012 the two women received a 9 month suspended sentence, to be of good behaviour for 12 months with $1,000 security, for each defendant.[57]

The question must be asked, when did so many of our "humanitarian" organizations become so disdainful about the lives of the desperately poor, whom they are supposed to be helping? How long have they been putting ideology over humanity? Do Greenpeace supporters understand that the conduct of the organization that they give to has been truly wicked?

Patrick Moore, one of the early leaders of Greenpeace in the 1970's when it took account of science and respected human life, has broken with his old organization for just this reason. He now works to expose Greenpeace's actions in the developing world and has joined with Golden Rice inventor Ingo Potrykus in calling for the organization to be tried for crimes against humanity.[58]

So I say to my friends in Europe and in the United States: next time some young volunteer stops you on the street to ask for money for Greenpeace, ask them about Golden Rice. They'll want to talk about all the polar bears and whales they claim to have saved, but ask them instead about the millions of children that their organization is helping condemn to blindness and early death.

It should also be recognized, however, that there are some humanitarian and environmental groups that are coming to recognize the important role that biotech can play in alleviating human suffering and spurring development. I'm thinking particularly of organizations such as Oxfam and the Nature Conservancy, whose initial opposition to GMOs has softened in the light of the overwhelming scientific evidence of their efficacy and safety. It's time for these organizations to step up and show leadership on this urgent humanitarian issue.

Where also are the UN organisations WHO, FAO, UNICEF – all with nutritional improvement and development mandates? They have recognized the scourge of vitamin A deficiency as a very major - and cheap to control - problem for the last 25 years. Undoubtedly current interventions have saved millions of lives. But VAD (Vitamin A Deficiency) induced preventable deaths continue, and now, as a result of Golden Rice, the half of the world where rice is the staple could benefit from a free nutritional trait. But, cowed by activist polemic, these huge and capable institutions have chosen not to believe in science.

Here is my plea to them: You have rejected the world of activist myth for scientific fact. Now use your moral authority to appeal to your colleagues in the NGO community. Convince them to do the right thing and support giving the developing world the GM tools it needs to feed its growing, and too often malnourished, population.

The EU's Retreat From Science

Of course, the greatest offender of all is the European Union itself, which in a twisted version of neo-colonialism has imposed its affluent organic affectations and anti-scientific policies on Africa.

The Kenyan-born Calestous Juma, professor of the practice of international development at Harvard Kennedy School, is a former executive secretary of the UN Convention on Biological Diversity, who has repeatedly slammed the EU for strong-arming African nations not to grow GM crops and threatening to cut off imports if they dare to assert their independence.[59]

I am proud that when I served as the Secretary of State for Environment, Food and Rural Affairs, we were able to convince the European Council of Ministers to change European policy so that now individual countries can decide for themselves whether to plant GMOs or not. This is a significant reform. I hope that when we look back over these years it will prove to have been a watershed moment, as nation after nation in Europe seizes the enormous opportunity offered by this exciting technology.

But we shouldn't fool ourselves into thinking that one reform will solve the problem. The EU's retreat from science has become more like a rout. Just last November, the incoming president, Jean-Claude Juncker, refused to renew the contract for the professor of cell biology, Anne Glover, who had been so ably filling the role of the Commission President's scientific advisor.

For months, Greenpeace and other NGOs had been conducting a concerted campaign against Professor Glover, largely because of her outspoken, science-based support of GMOs. In response, some forty leading scientific organizations and over 770 individuals sent a letter in support of Professor Glover and her position.[60]

It is emblematic of Europe today – once the birthplace of modern science and home to many of its greatest achievements – that the anti-science know-nothings won the day. And to think that the Lisbon treaty was meant to ensure that Europe developed a knowledge-based economy! No chance when scientific evidence is only merited with the same influence as public opinion, which as we have seen, is so easily influenced by political activists.

The European retreat from science is often dressed up as the precautionary principle, which has the advantage of sounding "sciency," but is in fact neither science-based nor by any legitimate definition a "principle." It's more like an impulse, or reflex, as clichéd and inept when it comes to the serious work of

regulation as saying "better safe than sorry." No one can really define it adequately. The best its advocates can do is say that if something could possibly cause harm, ban it.

Former Greenpeace UK director Stephen Tindale now urges Europe to "move on from the theological dispute with respect to GMO crops".[61]

Everyday, activists warn us of "risks". But everything, everywhere and always, could cause harm. You can drown in an inch of water. Coffee in large enough doses causes cancer. And let's not get started on cell phones.

The EU finds itself in the ridiculous position that, according to its own pesticide regulations, it would have to ban coffee – and beer, and a thousand other consumer items – if they were sprayed on fields rather than sold in grocery stores.[62]

The precautionary principle is so broad it effectively gives regulators the cover to ban or restrict anything at whim or according to whomever is exerting the most pressure. In other words, it replaces science-based regulation with politics. This drives the limits on the amount of pesticides in tap water, set at 0.1 parts per billion - the equivalent of one paracetamol tablet in an Olympic-sized swimming pool.[63]

We also saw the precautionary principle in action with startling clarity in the battle over neonicotinoids, or neonics, which activists accused of causing a "bee-pocalypse," an imminent extinction of bees. Large-scale field studies and massive real-world science do not back up this claim.[64] The EU's own science didn't back it up. Even at its most basic level, it was faulty: bee populations aren't falling at a rapid rate. They're not falling at all. For the last two decades that neonics have been on the market, bee populations have been rising, both in the EU and around the world.[65]

But the Green Blob was fierce on this one. I myself personally received 85,000 emails; very few of them were complimentary. Insisting, as we did at DEFRA, that policies be based on science - and the science did not support a ban - wasn't a popular position. Nor was it, as we know, the winning position. The EU Commission, as is its habit, caved in to the activists. Working with allies, I ensure that they couldn't muster a qualified majority for a ban among the member states, despite holding two votes on the issue. But democracy only goes so far in Brussels. So EU officials simply took it on themselves to make the final decision. They overrode their own scientists and banned neonics starting at the end of 2013.[66]

The result was predictable. I say that because it was indeed predicted by farmers and others who said the ban would remove their best defence against insect pests and force them to use older, less effective pesticides that are worse for bees. Which is precisely what has happened: despite multiple sprayings with pyrethroid, England's oil seed rape crop has been devastated, with losses over 40 per cent in some counties.[67] Europe as a whole is looking at a 15 per cent

reduction in rapeseed this year as a result of the ban.[68] Another example of the precautionary principle creating realised risks.

Just recently this scandal developed further – some have called it Beegate – when a blogger in Brussels by the name of David Zaruck uncovered a memo that had mistakenly been left on the web by one of the scientists who was most vocal in pushing for a ban. That memo – the minutes of a meeting held back in 2010 – detailed in their own words how he and other leading scientists working for the EU-funded "Task Force" on neonics conspired to manufacture studies to support a ban.[69] Perhaps one should put the word "scientists" here in quotes. Deciding on the outcome of your research before you even conduct it is not how science is supposed to be done. But we have apparently entered a brave new world in the EU where everything is backward.

For instance, there's the startling fact that the "technologically advanced" EU, which boasts incredibly fertile soils and extremely friendly climates for agriculture, cannot even feed itself and has been reduced to becoming a net importer of food.[70]

What that means, of course, is that we simply export our environmental footprint elsewhere. It also means Europe is not only *not* contributing, we are a net drag on humanity's foremost imperative in the 21st century – growing enough food to feed everyone on this planet, and to feed them well.

Today, nearly 805 million people do not have enough to eat, about one out of every nine people in the world. The majority of them are children, who will never have the same chance at a good life as others because hunger will stunt their development, shrink their innocent capacity for hope, and leave their small bodies prey to any number of terrible illnesses.[71]

One in three children in many developing nations today has been stunted by hunger. Sixty-six million attend school classes hungry every day. Poor nutrition causes nearly half of all the deaths of children less than five years of age – over three million children every year.[72]

This is the state of affairs that the EU's precautionary principle would effectively preserve.

The world population is seven billion today and will burst through the ten billion mark by 2050 or sometime soon after. Not long ago, one of our English celebrities was delivering a petition to our Prime Minister protesting against genetically modified foods. Being a famous and wealthy fashion designer, apparently, has given her particular insight into this field. In the process she was asked by a BBC interviewer what she would say to those who can't afford to eat the high-priced organic food she recommends. Her answer was simple. They should simply "eat less."[73]

Too many of our fellow human beings are already eating less. I don't believe that we, as Europeans, can really say that we belong to a humane society, a decent

society, until every single one of them has access to good, nutritious food. Until every human being on this planet has enough to eat.

That means that somehow we have to get right again with science. We need every possible tool available to meet this challenge. We simply cannot afford to take the most promising plant technologies off the table and keep them locked away in the regulatory drawer while children continue to go hungry.

Many centuries ago, science pulled the European continent out of the Dark Ages and established a whole new concept – one of on-going human progress.

In our own time, the extraordinary science promoted by one-man, Norman Borlaug, accelerated that progress in the plant sciences just in time to save over a billion people from mass starvation in the 1960s and 70s. That was called the Green Revolution. We stand today at the beginning of a second Green Revolution – a period of extraordinary breakthroughs that can do the job if we let them.

We must let them. Despite the flack. Despite the propaganda. Despite the political setbacks we sometimes encounter. We must all push forward.

Myth versus fact; Green Blob versus Green Revolution.

There is literally no challenge today that is more important.

I commend African Nations for showing Europe the way.

I am sure that science will overcome superstition.

I am confident that together we will all succeed.

Thank you very much.

ENDS

REFERENCES

[1] For example, see: World Bank Report: http://siteresources.worldbank.org/INTARD/Resources/sleeping_giant.pdf, see also *Financial Times*, 15 December 2013, Africa offers growth potential on a vast scale, http://www.ft.com/cms/s/0/fa46d61c-574e-11e3-9624-00144feabdc0.html#axzz3RNZX5lCe.
[2] http://ec.europa.eu/budget/fts/index_en.htm; http://www.telegraph.co.uk/news/politics/10978678/Owen-Paterson-Im-proud-of-standing-up-to-the-green-lobby.html
[3] http://www.isaaa.org/resources/publications/briefs/46/pressrelease/default.asp
[4] *Ibid*
[5] *Ibid*
[6] *Ibid*
[7] http://www.nepadbiosafety.net/subjects/biotechnology/status-of-crop-biotechnology-in-africa
[8] *Ibid*.
[9]http://www.isaaa.org/resources/publications/biotech_country_facts_and_trends/download/Facts%20and%20Trends%20-%20Burkina%20Faso.pdf
[10] See for instance, Krishna VV, Qaim M (2012) Bt Cotton and sustainability of pesticide reductions in India, *Agricultural Systems*, Volume 107, pp 47–55, http://www.sciencedirect.com/science/article/pii/S0308521X11001764. For a general overview, see: isaaa.org/resources/publications/biotech_country_facts_and_trends/download/Facts%20and%20Trends%20-%20Burkina%20Faso.pdf; http://www.idrc.ca/EN/Resources/Publications/Pages/ArticleDetails.aspx?PublicationID=666
[11] http://theconversation.com/hard-evidence-does-gm-cotton-lead-to-farmer-suicide-in-india-24045
[12] http://www.asa3.org/ASA/meetings/belmont2013/papers/ASA2013Greenplate.pdf
[13] http://gmoinfo.jrc.ec.europa.eu/gmp_browse.aspx
[14] http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0111629
[15] http://www.pnas.org/content/107/26/12052.full.pdf+html
[16] http://greenstate.tv/resources/detail/saving-natural-habitat-and-preserving-species-the-story-of-modern-agriculture
[17] https://www.agra-net.net/agra/public-ledger/features/analysis-indian-food-export-boom-targets-african-markets-457337.htm
[18] An overview of the effects of the Green Revolution is here: http://www.ifpri.org/sites/default/files/pubs/pubs/ib/ib11.pdf
[19] Goklany IM (2002), Comparing 20th Century Trends in U.S. and Global Agricultural Water and Land Use, *Water International*, Volume 27, Number 3, Pages 321–329, http://goklany.org/library/Water%20International%202002.pdf http://books.google.co.uk/books?id=sTXbAAAAMAAJ&q=indur+goklany+82+%+38%&dq=indur+goklany+82+%+38%&hl=en&sa=X&ei=rcfBUaG1KsaCPabwgLgI&ved=0CDAQ6wEwAQ
[20] www.normanborlaug.org/knatvig/FOREWORD_Kendall.doc
[21] http://www.ceres.net/News/Events-WAG-PDF/Resources/Keystone-Field-to-Market__01122009.pdf
[22] https://www.fieldtomarket.org/report/national-2/PNT_SummaryReport_A17.pdf
[23] http://www.savingtheoasis.com
[24] http://weedcontrolfreaks.com/2014/06/salt-vinegar-and-glyphosate/
[25] http://www.geneticliteracyproject.org/2014/11/26/glp-infographic-all-gmo-research-is-industry-funded-biofortified-analysis-sets-record-straight/
[26] http://www.forbes.com/sites/jonentine/2013/08/29/are-gmos-safe-global-independent-science-organizations-weigh-in/
[27] For a review of these issues, see: http://toxsci.oxfordjournals.org/content/71/1/2.full
[28] MON810 was approved for use in the European Union in 1998. Since then, six countries have grown it and six countries (Austria, Hungary, Greece, France, Luxembourg, and Germany) have banned its cultivation. http://en.wikipedia.org/wiki/MON_810
[29] Van Eenennaam A L & Young AE (2014), Prevalence and impacts of genetically engineered feedstuffs on livestock populations, *Journal of Animal Science*, 92: 10, pp. 4255-4278, https://www.asas.org/docs/default-source/jas-files/final.pdf?sfvrsn=0
[30] For instance, see: Kankolongo MA, Hellb K and Nawac IN (2009), *Assessment for fungal, mycotoxin and insect spoilage in maize stored for human consumption in Zambia*, J Sci Food Agric,

http://www.aflasafe.com/c/document_library/get_file?p_l_id=524558&folderId=772841&name=DLFE-4702.pdf

[31] Bowers E, Hellmich R, Munkvold G (2014) Comparison of Fumonisin Contamination Using HPLC and ELISA Methods in Bt and Near-Isogenic Maize Hybrids Infested with European Corn Borer or Western Bean Cutworm. J. Agricultural and Food Chemistry, 62:6463-6472.

[32] http://www.fao.org/docrep/U3550t/u3550t0e.htm

[33] http://www.ifpri.org/sites/default/files/publications/aflacontrol_wp04.pdf

[34] http://aatf-africa.org/files/Aflatoxin-brief.pdf

[35] Nature Biotechnology, (Editorial) Another inconvenient truth, Vol. 25, Number 12, December 2007, p. 1330, http://www.nature.com/nbt/journal/v25/n12/full/nbt1207-1330.html

[36] http://www.gmo-compass.org/eng/news/519.usa_new_gm_soybean_higher_oleic_acid_content_approved.html

[37] http://www.geneticliteracyproject.org/2013/03/21/modified-tomatoes-mimic-actions-of-good-cholesterol/

[38] Zhang Y., Butelli E., Martin C. (2014) Engineering anthocyanin biosynthesis in plants. CURRENT OPINION IN PLANT BIOLOGY 19:81-90.

[39] Forbes, 13 February 2015, USDA Just Approved Apples That Don't Turn Brown http://www.bloomberg.com/news/articles/2015-02-13/apples-that-don-t-brown-approved-for-u-s-planting?hootPostID=efcdecba0c732423c39765f7e2a39774

[40] http://www.forbes.com/sites/henrymiller/2015/01/07/claims-for-organic-agriculture-need-more-sunlight-less-shade/print/

[41] http://www.wired.com/wiredscience/2008/11/peanuts-with-le/

[42] Petrie J, Nichols P, Devine M, Singh S: Engineered oilseed crops with fish oil DHA levels. *Inform* 2013, 24: 648-652

[43] Betancor MB *et al* (2015), 'A nutritionally-enhanced oil from transgenic Camelina sativa effectively replaces fish oil as a source of eicosapentaenoic acid for fish', Sci.Rep. 5, 8104; DOI: 10.1038/srep08104

[44] Vanhercke T, Tahchy A, Liu Q, Zhou XR, *et al*, (2014) Metabolic engineering of biomass for high energy density: oilseed-like triacylglycerol yields from plant leaves. *Plant Biotechnology Journal*, 12: 231-239

[45] http://www.geneticliteracyproject.org/2014/04/29/cheese-the-gmo-food-that-even-die-hard-gmo-opponents-eat-and-love/

[46] Renneberg, Biotechnology for Beginners

[47] http://www.the-scientist.com/?articles.view/articleNo/41676/title/There-s-CRISPR-in-Your-Yogurt/

[48] Dubock A (2014) The politics of Golden Rice, GM Crops & Food: Biotechnology in Agriculture and the Food Chain, 5:3, 210-222, DOI , http://www.tandfonline.com/doi/pdf/10.4161/21645698.2014.967570

[49] World Health Organisation, Micronutrient deficienciesVitamin A deficiency, http://www.who.int/nutrition/topics/vad/en/

[50] http://www.allowgoldenricenow.org/the-crime-against-humanity

[51] http://news.smh.com.au/breaking-news-national/greenpeace-attacks-canberra-gm-wheat-crop-20110714-1hflf.html; http://www.independent.co.uk/environment/greenpeace-gm-crop-attack-declared-legal-698440.html;

[52]http://www.slate.com/blogs/future_tense/2013/08/26/golden_rice_attack_in_philippines_anti_gmo_activists_lie_about_protest_and.html?original_referrer=http%253A%252F%252Ft.co%252FXWJCWmVTCF

[53]http://www.fastenopfer.org/data/media/dokumente/projekte/11_12_projekte_unterlagen/philippinien/Allgemeine%20Unterlagen%20PHILIPPINEN.pdf.pdf

[54] http://www.misereor.org

[55] http://blogs.nature.com/news/2013/11/swedish-scientists-decry-government-links-to-anti-gmo-vandals.html;
http://cso.sida.se/Project/Index/79844;
http://cso.sida.se/?text=masipag&FrameworkOrganisationId=&SectorGroupId=&CountryCode=&targetYear=&btn=Sök&SearchOrExport=Search

[56] http://masipag.org/wp-content/uploads/2013/05/Food-Security-and-Farmer-Empowerment.pdf; http://www.trocaire.org/our-funders

[57] http://www.abc.net.au/news/2011-07-15/scientists-condemn-greenpeace-gm-cull/2795482

[58] http://www.allowgoldenricenow.org/the-crime-against-humanity

[59] *Independent*, 3 June 2013, Europe's GM stance denies Africa the right to feed itself, warns leading academic; http://www.independent.co.uk/news/science/europes-gm-stance-denies-africa-the-right-to-feed-itself-warns-leading-academic-8641327.html
[60] *The Guardian*, 13 November 2014, Juncker axes Europe's chief scientific adviser http://www.theguardian.com/science/political-science/2014/nov/13/juncker-axes-europes-chief-scientific-adviser
[61] http://www.cer.org.uk/insights/genetically-modified-crops-time-move-theological-dispute
[62]http://www.realclearmarkets.com/articles/2013/06/11/less_risk_more_bodily_harm__100392.html
[63] Anderson (Report), The effect of The Loss of Plant Protection Products on UK Agriculture and Horticulure and the Wider Economy, hehttp://www.nfuonline.com/andersons-final-report/
[64] http://www.forbes.com/sites/jonentine/2013/04/11/science-collapse-disorder-the-real-story-behind-neonics-and-mass-bee-deaths/2/, and http://www.forbes.com/sites/jonentine/2014/02/05/bee-deaths-reversal-as-evidence-points-away-from-neonics-as-driver-pressure-builds-to-rethink-ban/
[65] http://www.agprofessional.com/news/bee-population-rising-around-world
[66] http://www.eureferendum.com/blogview.aspx?blogno=84472
[67] http://www.thetimes.co.uk/tto/opinion/article4227789.ece http://www.rationaloptimist.com/blog/bees-and-pesticides.aspx
[68] http://www.bloomberg.com/news/2015-01-08/bugs-invade-europe-as-save-bees-cry-spurs-pesticide-ban.html
[69] http://risk-monger.blogactiv.eu/2014/12/02/iucn's-anti-neonic-pesticide-task-force-an-expose-into-activist-science/#.VKxA5Fqp3wx
[70] http://www.science20.com/agricultural_realism/should_world_keep_feeding_europe-113562
[71] World Food Programme, Hunger Statistics, http://www.wfp.org/hunger/stats
[72] *Ibid*
[73] *The Daily Telegraph*, 12 November 2014, Vivienne Westwood: People who can't afford organic food should eat less http://www.telegraph.co.uk/health/healthnews/11225326/Vivienne-Westwood-People-who-cant-afford-organic-food-should-eat-less.html

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