GM Team
Department for Environment, Food and Rural Affairs
Area 1C, Nobel House
17 Smith Square
London, SW1P 3JR
Submitted by email to gm-regulation@defra.gsi.gov.uk

16 March 2017

Dear Madam/Sir

Re: Application from The Sainsbury Laboratory to release a genetically modified organism, reference 17/R29/01 as published at https://www.gov.uk/government/publications/genetically-modified-organisms-sainsbury-laboratory-17r2901

Contact address: GM Freeze, 80 Cyprus Street, Stretford, Manchester M32 8BE
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We are writing on behalf of GM Freeze, the Soil Association, Garden Organic, Organic Research Centre, North London Organic Gardeners, the Organic Growers Alliance, WWOOF UK, Shepton Farm, Whole Organic Plus, South East Essex Organic Gardeners, the Kindling Trust, ACE Energy, Sheepdrove Organic Farm, Unicorn Grocery, Loopy Food, The Kitchen, Friends of the Earth (England Wales and Northern Ireland), West Dorset Friends of the Earth, Cardiff Friends of the Earth, South Gloucester Friends of the Earth, Gravesham Friends of the Earth, Welwyn Hatfield Friends of the Earth, Action Against Allergy, the Gaia Foundation, the Springhead Trust, GM Watch, GeneWatch UK, EcoNexus, Beyond GM, Mums Say No to GMOs, GM Free Cymru, GM Free Dorset and GM Free South West to request that the above application to release genetically modified (GM) potatoes is refused.

GM Freeze is the umbrella campaign for a moratorium on GM in food and farming in the UK.

The **Soil Association** is the UK's leading membership charity campaigning for healthy, humane and sustainable food, farming and land use. **Garden Organic** (formerly known as the Henry Doubleday Research Association) is the UK's leading organic growing charity with over 20,000 members throughout the UK and abroad. **Organic Research Centre** is the UK's leading independent research centre for the development of organic/agroecological food production and land management solutions to key global issues. **North London Organic Gardeners** is a local group of Garden Organic based in Winchmore Hill. The **Organic Growers Alliance** supports and represents growers involved in commercial organic horticulture. **WWOOF UK** (World Wide Opportunities on Organic Farms) is a membership charity which connects people wanting to learn about ecological growing and low impact lifestyles with sites across the country living ethically and needing practical help on the land. **Shepton Farm** in Somerset grows grass/clover, arable crops and apples. **Whole Organic Plus** advises on organic production, food quality and health. **South East Essex Organic Gardeners** promotes the principles of organic gardening. The **Kindling Trust** is working towards a just and ecologically sustainable society. **ACE Energy** helps farmers to use less energy intensive methods of farming. **Sheepdrove Organic Farm** and award-winning eco-conference centre are committed to sustainability, conservation and education.

Unicorn Grocery in Manchester has pioneered a cooperative approach to sustainable urban food supply**. Loopy Food** is the Directory of Food with values: local, organic, open-pollinated, yummy! **The Kitchen** is a co-operative café using simple, fresh ingredients to create tasty, affordable and nutritious food.

Friends of the Earth (England, Wales and Northern Ireland) exists to create a just world where people and nature thrive. **West Dorset Friends of the Earth, Cardiff Friends of the Earth, South Gloucester Friends of the Earth, Gravesham Friends of the Earth** and **Welwyn Hatfield Friends of the Earth** work to deliver these aims at a local level.

Action Against Allergy provides information and support to those made chronically ill through different forms of allergy and those who care for them. The **Gaia Foundation** works with local and indigenous communities, civil society groups and social movements to restore a respectful relationship with the earth. The **Springhead Trust** promotes environmental education, sustainability, organic agriculture and local performing arts.

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GM Watch is a news and information service that aims to keep the public up to date on issues around GM crops and foods and associated pesticides. **GeneWatch UK** monitors developments in genetic technologies from a public interest, human rights, environmental protection and animal welfare perspective. **EcoNexus** analyses developments in science and technology and their impacts on environment and society. **Beyond GM** is a UK campaigning group raising the level of public understanding and engagement with issues around GMOs. **Mums Say No to GMOs** is a coalition of mothers and their families using consumer pressure to stop GM crops being grown and sold in the UK. **GM Free Cymru** is the community pressure group campaigning to keep Wales free of genetically-modified crops. **GM Free Dorset** is a grass roots campaign supported by individuals, groups, local businesses and charities that exist to promote rural sustainability. **GM Free South West** is a regional group raising awareness of increasing concerns about genetic engineering and synthetic biology.

We do not believe that this trial should go ahead. The applicant has neglected to consider a number of serious and complex hazards. The trial represents a significant risk and will not benefit society.

In summary, our objection covers the following points:

1. The application for a field trial is premature.
   - 1.1. The molecular characterisation of five of the proposed six lines is missing.
   - 1.2. Interactions between genes and between traits have not been evaluated.
   - 1.3. There is no consideration of potential adverse effects from the insertion of gene-silencing modules.
   - 1.4. The justification for a field trial is weak.

2. The GM potato lines contain a wide range of stacked traits, increasing the potential for unexpected interactions and synergisms, with unintended consequences.

3. The application does not include any consideration of the potential hazards of the gene-silencing module and risk assessment for RNAi-based genetic modifications is not currently possible. We detail:
   - 3.1. Food safety risks of the genetic modification for gene silencing.
   - 3.2. Environmental risks of the genetic modification for gene silencing, in particular the potential impact on non-target organisms.

4. The proposed trial also presents several more familiar, potentially significant, risks. These include:
   - 4.1. The potential impacts of the synthetic nematode repellent on non-target soil organisms.
   - 4.2. The potential impact of herbicide tolerance genes.
   - 4.3. The GM potatoes may contain an antibiotic resistance marker gene.
   - 4.4. The risk of GM contamination.

5. The trial will not be of benefit to society because:
   - 5.1. The eventual crop will be of no net benefit to consumers.
   - 5.2. There is no market for GM potatoes.
   - 5.3. Genetic modification is not necessary for either blight resistance or PCN resistance.

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1. The application for a field trial is premature.

The applicant states that “most of the transgenic plants described in this application are currently in the transformation pipeline” (Part A1, pg. 28, para 5). Thus, the GM potatoes have not been created, much less tested in the laboratory for either efficacy or food, feed and environmental safety. The following deficiencies need to be examined in contained use before a field trial can be considered:

1.1. The molecular characterisation of five of the proposed six lines is missing.

Only one line has any degree of molecular characterisation (the line generated with construct SLJ24895, Annex 1, Section 3). Even this does not investigate whether any of the DNA from the plant or any fragments of the construct have been deleted or re-arranged by the process of genetic modification. A field trial should not be considered until all GM potato lines have been thoroughly characterised molecularly, and that information placed in the public domain.

1.2. Interactions between the genes and between traits have not been evaluated.

As discussed under 2, below, the proposed trial includes a range of stacked traits. The genes are stacked ‘molecularly’, that is each line is genetically engineered with a single gene construct that contains all the relevant genes. The possibility of interaction between the inserted genes and/or traits; and between inserted and existing genes, is significantly increased by the insertion of so many genes at once. Similarly, engineering a single plant to express such a large number of new traits also increases the possibility of interaction between traits.

The European Food Safety Authority (EFSA) gives specific, additional guidance for the risk assessment of GM crops containing stacked traits[1,2]. This focuses on whether the introduced genes and their products could interfere or interact with each other; whether there could be synergistic or antagonistic effects, eg whether the combination of products might affect human health or non-target organisms; and whether the combination of traits has implications for the management of the GM crop. The applicant has only considered each trait independently but has not assessed any of the potential interactions between the traits. The GM potato lines can and should be tested for potential interactions and the results should be placed in the public domain before there is any consideration of a release into the environment.

1.3. There is no consideration of potential adverse effects from the insertion of gene-silencing modules.

There is no risk assessment of any adverse effects from the gene-silencing operation of the genes inserted to “improve tuber quality”, in particular the formation of double stranded RNA (dsRNA) in the plant. We detail specific concerns about RNAi-based genetic modifications under 3, below. If a full risk assessment of the gene-silencing modules cannot be provided, the field trial should not go ahead. The applicants should, in particular, be required to characterise the presence of dsRNA in the plants and consider (via experiments in contained use if necessary) any potential adverse effects to humans, animals or the environment.

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1.4. The justification for a field trial is weak.

In 2016, ACRE granted consent for a field trial (which we understand is still ongoing) for lines of GM potatoes carrying single late blight resistance genes. GM Freeze et al.[3] commented that the approach of using single genes was not likely to provide durable resistance. The current application contains stacked resistance genes, suggesting that the previous trial has been of limited value.

In contrast, this new field trial application includes a wide range of additional insertions that have not yet been carried out, a number of which will not be evaluated by the applicant (Part A1, pg. 43, para 5). This raises serious questions about the scientific basis of the trial and what exactly will be learnt.

2. The GM potato lines contain a range of stacked traits, increasing the potential for unexpected interactions.

The application to field trial GM potatoes is for several lines[a] incorporating traits for:

a) Single gene late blight resistance (three lines each containing single resistance genes) combined with herbicide tolerance (SLJ24895, SLJ24896(S/L), SLJ24897).
b) Stacked gene late blight resistance (one line containing three stacked resistance genes) combined with herbicide tolerance (SLJ24909(S/L)).
c) Resistance to potato cyst nematodes (PCN) (two stacked genes – one that inhibits digestion in the nematode and one that produces a synthetic nematode repellent) combined with herbicide tolerance (SLJ24904)
d) Stacked gene late blight resistance (three stacked genes) combined with resistance to potato cyst nematodes (two stacked genes) and herbicide tolerance (SLJ24933(S/L)).
e) Stacked gene late blight resistance (three stacked genes) combined with resistance to potato cyst nematodes (two stacked genes) and gene silencing aimed at lowering the potential for blackening and acrylamide formation upon cooking (two stacked genes – one to silence a gene that produces asparagine and the other to silence a gene that produces sugars during cold storage, known as cold sweetening) and herbicide tolerance. (SLJ24918(S/L))
f) In addition, all or any these GM potato lines might also exhibit antibiotic resistance if the relevant part of the vector used to genetically modify the plants is inadvertently incorporated into the GM plant during the genetic engineering process.

The experimental potatoes in the proposed trial will incorporate a great number of functional genes and traits. The most complex line (SLJ24918(S/L)) will have a total of 32 genetic elements inserted: eight functional genes conferring four separate traits, with the additional possibility of antibiotic resistance.

Genetic modification is promoted to the public as the straightforward insertion of individual genes conferring simple traits. The complexity of this proposed trial reveals a more worrying step towards a 'transgenic treadmill' where an increasing number of genes and traits are inserted into a single GM crop. The mixing of pest resistance with 'designer' traits focused on 'tuber quality' takes us a significant step towards the production of very complex GMOs where numerous novel compounds are produced at once. This considerably increases the potential for unexpected interactions between both genes and compounds produced, with implications for food, feed and environmental safety.

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[a] Short and long variants (S/L) of plasmids are viewed as one GM line.

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3. **The application does not include any consideration of the potential hazards of the gene-silencing module and risk assessment for RNAi-based genetic modifications is not currently possible.**

One of the lines of GM potato in this proposed trial contains two gene-silencing modules. In GM plants, such modules are used to either alter the metabolism/composition of the plant or to act as a pesticide, notably towards invertebrates. Gene silencing in these GM plants uses RNA interference (RNAi) to 'switch off' or silence certain target genes. Through genetic engineering, two copies of the gene to be silenced are inserted, one in a forwards fashion and the other in a backwards (or antisense) fashion. The two genes together produce double stranded RNA (dsRNA) instead of the usual messenger RNA (mRNA) that goes on to instruct protein production. The dsRNA is processed (in this case within the plant) into short interfering RNA (siRNA) that prevents production of the protein from the gene. Hence, the target gene is 'silenced' by the process of RNAi.

In this GM potato, the aim of the gene silencing is to "prevent browning upon bruising, accumulation of asparagine and cold-induced potato sweetening, lowering the potential for blackening and acrylamide formation upon cooking" (Part A1, pg. 9, para 6). Specifically, the modules are designed to silence the polyphenol oxidase gene *Ppo*, the asparagine synthetase-1 gene *Ast1* and the vacuolar acid invertase gene *VInv* in tubers. Although the exact mechanism of gene silencing is not described in the referenced publications (Rommens et al. 2008; Ye et al, 2010; Bhaskar et al, 2010; Chawla et al, 2012), it undoubtedly involves the production of dsRNA as alluded to in the application (Part A1, pg. 10, para 1), causing RNAi within the potato, as alluded to by Rommens et al. (2008)[4].

RNAi-based gene silencing can be described as an emerging technology as it is so far limited to a very few commercial GM crops. As far as we are aware, there have been no previous applications to field trial an RNAi-based GM crop in the UK. Similarly, there have not been any applications to the European Union (EU) to import, market or cultivate such a GM crop. There are no existing guidelines to performing a risk assessment for RNAi-based GM crops.

Although this type of genetic modification does not produce a protein as most commercial GMOs do (eg Bt maize, Roundup Ready soya), there are several serious concerns regarding the environmental and food safety of RNAi-based GM crops. Any risk assessment of RNAi-based GM crops is hindered by large and significant gaps in the scientific knowledge of the extent to which gene silencing can cause adverse effects and, indeed, what the nature of such effects could be. In order to begin identifying knowledge gaps and issues unique to the risk assessment of RNAi-based crops, EFSA convened an international scientific workshop in June 2014[5]. EFSA has also commissioned a literature review of baseline data to inform the risk assessment of RNAi-based GM plants[6]. However, no conclusions have been drawn and there are currently no EFSA guidelines for the risk assessment of RNAi-based GM crops. It is simply too early to know what could go wrong with this method.

Potential adverse effects of RNAi-based gene silencing in GM plants including the following:

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3.1. Food safety risks of the genetic modification for gene silencing.

Potential adverse effects of RNAi-based gene silencing include the possible uptake of dsRNA into humans via the gastro-intestinal tract, where it could silence native (endogenous) genes[7]. Although the dsRNA is *probably* processed within the plant to siRNA, and single stranded RNA has been found to be “readily degraded by human digestive fluids (Liu et al, 2015)” (Part A1 pg 35, para 35), dsRNA may still be present in the tubers. Liu et al. (2015) did not analyse the digestibility of dsRNA. It is quite possible that at least some dsRNA is not readily degraded by human digestive fluids and could survive the human digestive system[8].

Within the plant, there are concerns that the dsRNA/siRNA may have off-target effects and silence genes other than the target genes[9]. This increases the potential for unexpected and unpredictable effects. Indeed, unexpected effects have already been observed from similar gene silencing in potatoes. When *Ast1* and *2* were both silenced in potatoes (as opposed to only the *Ast1* silenced in this application), this unexpectedly lead to cracking and secondary growths in the tubers[10]. Such unexpected effects are, by definition, not possible to predict, and could affect food safety. Unexpected effects in GM potatoes are of particular importance because they could increase glycoalkaloid concentrations to levels where they would be unsuitable for human consumption.

dsRNA and siRNA strands are already present in the human diet from conventional food sources. However, this does not imply any food safety as the dsRNA and siRNA strands in this GM potato would be novel and not previously included in the diet of humans[11].

The GM potato that has been deregulated (ie allowed to be grown commercially) in the USA is the “Innate” GM potato, which has been genetically modified for traits relating to late blight resistance, low acrylamide potential, reduced black spot, and lowered reducing sugars. However, the US approval of this GM potato has been controversial, not only because of a lack of animal feeding trials[12], but also a lack of consideration of the potential risks of the genetic modification relating to gene silencing[13]. This highlights the deficiencies of the product-based US regulatory system for GM crops, which is currently under review[14].

We are aware that any potatoes grown in the proposed trial will not be allowed to enter the human or animal food chain. However, there is no justification in allowing an open-air field trial of a potato that could be entirely unsuitable for human consumption. Contained experiments should be conducted to establish food safety before allowing these experimental plants to be grown in the field.

3.2. Environmental risks of the genetic modification for gene silencing, in particular the potential impact on non-target organisms.

dsRNA can potentially also have adverse effects on non-target organisms. dsRNA is quite persistent in the environment[15] and non-target organisms may be exposed to dsRNA strands from the experimental potatoes if they consume plant tissue (living or decaying) or are exposed to plant exudates[16]. For this GM potato line, this could be relevant for soil biota as the gene-silencing module is expressed in the tubers.

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Although the intention of the gene-silencing genetic cassette in this GM potato is altered metabolism, it is possible the dsRNA produced could adversely affect non-target organisms. For example, if the dsRNA was taken up into a non-target organism, the mechanism to process dsRNA to siRNA could be triggered. If the siRNA subsequently produced were to match an mRNA sequence in the non-target organism[17], it could interfere with gene expression in the organism, resulting in unintended gene silencing, causing an unintended adverse effect. The degree to which this is possible Is not yet known as the library of dsRNA strands that occur in plants and animals is far from complete, and the necessary degree of matching between the various components involved is not yet known. This is a plausible environmental risk that needs to be assessed before a field trial can be considered. As Roberts et al. (2015)[18] conclude,
"*The discovery of RNAi … has the potential for practical applications in producing desirable phenotypes in plants either through the selective silencing of target genes in the plant or through the production of dsRNA complementary to mRNA transcripts in target pests. The use of this technology, particularly through GE plants, will be accompanied by environmental risk assessments which will consider the potential for harmful impacts to NTOs. Although current knowledge may well be sufficient to conduct case specific risk assessments, it is clear that our current understanding of the susceptibility of organisms to environmental exposure to dsRNA, as well as the parameters which influence the likelihood of off-target gene effects are not complete.*"

Discussion of these important potential hazards from dsRNA and RNAi is wholly absent from the application, with the applicant simply stating that "no toxic or allergenic potential" is expected on the grounds that they do not produce proteins (Part A1, pg. 35, para 4; Part A2, pg. 11 para 3). Consent for the field trial should be refused on the grounds that the gene-silencing modification presents potential risks to both food safety and non-target organisms and it is not possible at the current time to assess these risks.

4. The proposed trial also presents several more familiar, potentially significant, risks.

4.1. The potential impacts of the synthetic nematode repellent on non-target soil organisms.

One of the two genes conferring resistance to PCNs codes for a "repellant of synthetic origin" (Part A1, pg. 9 para 3) which "is not lethal to nematodes" (Part A1, pg. 35, para 4). The authors state that "previous studies have shown that this strategy confers resistance against potato cyst nematodes without impact on non-target nematodes" (Part A1, pg. 40, para 1). However, there are any number of soil-dwelling organisms that could be adversely affected by this repellant and potential impacts on these organisms have not been considered. Consent for the field trial of GM potatoes expressing the synthetic repellant should be refused on the grounds that potential adverse effects on soil organisms other than nematodes, and consequent impacts on soil ecosystems, have not been considered.

4.2. The potential impact of herbicide tolerance genes.

All of the lines of GM potato in the proposed trial will be tolerant to sulfonylurea and imidazolinone herbicides. Although the applicant states "This trait will be used only for the in vitro selection of transgenic lines during tissue culture." (Part A1 pg. 33, para 3), there is no guarantee that the herbicide tolerance trait will not be utilized by farmers, in the event of commercial growing. This could increase the use of these herbicides and potentially lead to problems with weed resistance as has happened with glyphosate in areas where Roundup Ready crops are cultivated, eg in North America[19]. No GM crops containing herbicide tolerant traits should be released into the environment.

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4.3. The GM potatoes may contain an antibiotic resistance marker gene.

All constructs used in the development of the GM potatoes contain the antibiotic resistance marker gene, *nptII* which confers resistance to the antibiotics kanamycin and neomycin. This could be incorporated into the plant unintentionally (Part A1, pg. 36, para 3). GM Freeze et al. (2016) [20] were highly concerned at the inclusion of this antibiotic marker resistance gene in the previous field trial of GM potatoes (16/R29/01) and remain so. Although ACRE "remains of the opinion that the therapeutic effect of antibiotics that are substrates for NPTII will not be compromised by the presence of the *nptII* gene in GM plants." [21], this is not in keeping with the precautionary principle to limit resistance to antibiotics, which is currently given a very high priority in Europe[22].

We remind ACRE of the European Medicines Agency criticism[23] of EFSA's opinion that neomycin and kanamycin are of "minor therapeutic importance" and again urge the Minister to prohibit the testing of GM crops containing antibiotic resistance marker genes. It is vital to ensure none of these GM potatoes contain antibiotic resistance genes.

4.4. The risk of GM contamination.

In its response to the recent GM potato field trial (16/R29/01) GM Freeze et al. (2016)[24] detailed the risks of GM contamination arising from cultivation of GM potatoes, and the Maris Piper variety in particular. ACRE[25] noted that such GM contamination is possible, although the committee considered cultivated potatoes a low risk. ACRE recognized that "rare long-distance cross-pollination events are possible, especially where pollen beetles are common in the area of the trial site". However unlikely it may seem in theory, there are two recorded incidents of GM potato contamination, both occurring in field trials[26].

ACRE also stated[27] that "volunteers resulting from true seed are very vulnerable to herbicide applications". However, the GM potatoes that are the subject of the current application for a field trial contain genes conferring herbicide tolerance to sulfonylurea and imidazolinone herbicides, so volunteers may not necessarily be controlled by herbicides.

ACRE recommended[28] monitoring of the existing GM potato field trial site (16/R29/01) for two years. However, we noted "that true seed produced by Maris Piper could remain dormant in the soil. It is reported that soil dormancy can be as long as ten years for true potato seed[29]". We do not consider two years' monitoring to be sufficient to prevent GM contamination.

As noted in our previous comments, any such GM contamination, or even the threat of contamination, could damage affected growers and the many smaller scale potato product manufacturers financially, especially if contamination undermined their brand and reputation as purveyors of quality products. We note that, when considering public concerns about a GM wheat trial earlier this year (16/R08/02), ACRE judged crop contamination "an economic issue that is beyond ACRE's remit"[30]. However, it must surely be within *somebody's* remit. We urge the Minister to take responsibility for the potential economic, social and ethical impacts of this trial and, therefore, deny consent.

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5. The trial will not be of benefit to society.

5.1. The eventual crop will be of no net benefit to consumers.

None of the traits in these GM potato lines presents real benefits to consumers. Consumers are advised[31] to reduce intake of acrylamide (contained in the browning colour of foods cooked at high temperatures) but the most beneficial way for them to do so is to eat less fried starchy food. The chips and crisps likely to be produced from non-browning potatoes will still be high in fat and frequently laden with salt. The marketing of end products from this kind of potato as a "healthy" alternative will undermine more holistic public health messages encouraging people to eat a balanced diet low in fried and processed foods. The net result of these potatoes - should they ever come to market - is, therefore, unlikely to be beneficial to public health.

5.2. There is no market for GM potatoes.

GM Freeze et al. (2016) [32] have previously commented that there is no market for GM potatoes as all major UK supermarkets have a policy of not stocking GM produce for human consumption. The approval for commercial growing of the "Innate" GM potato is cited by the applicants (Part A1, pg. 35, para 4). However, several food retailers in the USA, including the fast-food chain McDonalds, have pledged not to use the Innate, or any other GM potato in their products[33] This move, in a country where GM ingredients are common and not subject to clear consumer labelling, clearly demonstrates that there is no market for such GM potatoes.

As before [34], we conclude that the public money being invested in late blight research should be redirected to conventional breeding research focusing on marker assisted selection and alternative agroecological approaches to late blight, PCN and weed management (see Section 5.3 below).

5.3. **Genetic modification is not necessary for either blight resistance or PCN resistance.**

In its response to the applicant's previous GM potato field trial (16/R29/01) GM Freeze et al. (2016)[35] detailed that genetic modification was not necessary for resistance to late blight (*Phytophthora infestans)* in potatoes because a range of conventional solutions are available. These include selective breeding to introduce genetic resistance that will prevent crop infection; organic and inorganic fungicide treatments for infected crops; planting cultivar mixtures to reduce the severity of the disease; and phytosanitary measures, such as controlling infection from out grade piles and volunteers.

The three late blight resistance genes inserted into the potatoes in the proposed trial are already found, alongside tens of others, in potato varieties and species (*Solanum* spp). The application of marker assisted selection (MAS) to introgress and "pyramid" resistance genes from varieties displaying resistance to late blight has shown advances in recent years[36]. The MAS approach is far more amenable to pyramiding resistance genes in potatoes providing more durable resistance than the genetic engineering approach as greater numbers of resistance genes are included.

Resistance to PCN, including to *Globodera pallida* and *G. rostochiensis,* can also be achieved by MAS. Although not as advanced as MAS for resistance to late blight, many molecular markers have now been identified[37], greatly facilitating the application of MAS for PCN resistance. Now that the potato genome has been sequenced[38], it is expected that many more traits will be bred into potato varieties, without the need for GM.

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This trial includes several genetic modifications that have not previously been seen in the UK. The applicant has failed to assess a large number of potential risks and is, at best, premature in seeking consent for deliberate release. We urge the Minister to deny consent and prevent this open-air trial from going ahead.

Yours faithfully

Liz O'Neill Director, **GM Freeze**	Helen Woodcock Director, **The Kindling Trust**	Clare Oxborrow Senior Campaigner, **Friends of the Earth (England, Wales and Northern Ireland)**	Tom Latter Co-founder, **GM Free Cymru**	Dr Bruce D Pearce Deputy Director, **Organic Research Centre**
Juliet and Peter Kindersley, Farmers, **Sheepdrove Organic Farm**	Dr Helen Wallace Director, **GeneWatch UK**	Louise Payton Policy Officer (Farming and Land use), **Soil Association**	Ricarda Steinbrecher Co-Director, **Econexus**	James Campbell Chief Executive, **Garden Organic**
Jane O'Meara Spokesperson, **GM Free Dorset**	Liz Hosken Director, **The Gaia Foundation**	Claire Robinson Editor, **GM Watch**	Debbie Clarke Co-Operative Member, **Unicorn Grocery Ltd**	Scarlett Penn Chief Executive, **WWOOF UK** (World Wide Opportunities on Organic Farms)
Alan Schofield Chairman, **Organic Growers Alliance**	Adrian Patch Director, **Loopy Food**	Kath Baron Secretary, **The Kitchen**	Pat Schooling Executive Director, **Action Against Allergy**	Sally Beare Campaigner, **Mums Say No to GMOs**
Pat Thomas Director, **Beyond GM**	Carole Shorney Secretary, **South East Essex Organic Gardeners**	Chris Brown Coordinator, **Cardiff Friends of the Earth**	Edward Parker Trust Manager, **The Springhead Trust**	
Alan Pinder Coordinator, **South Gloucester Friends of the Earth**	Scott Morrison Coordinator, **West Dorset Friends of the Earth**	Janet Edwards Treasurer, **Welwyn Hatfield Friends of the Earth**	Kevin Johncock Joint Coordinator, **Gravesham Friends of the Earth**	Sue Campbell Coordinator, **North London Organic Gardeners (NLOG)**
Louise Somerville-Williams Spokesperson, **GM Free Southwest**	Oliver Dowding Farmer, **Shepton Farms Limited**	Lee Smith Managing Director, **ACE Energy Ltd**	Lawrence Woodward Director, **Whole Organic Plus**	

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RNA Glossary

dsRNA	double stranded RNA
RNAi	RNA interference
mRNA	messenger RNA
siRNA	short interfering RNA

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