Aphid pheromone wheat, Rothamsted UK

Clippings by J.Tammisola, Sep 8, 2013

https://www.gov.uk/government/news/defra-approves-extension-of-gm-wheat-trial

News story

Defra approves extension of GM wheat trial

Organisation:

Department for Environment, Food & Rural Affairs

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Published 13 June 2013

Defra has given approval for Rothamsted Research to extend a trial of GM wheat this autumn.

The independent Advisory Committee of Releases to the Environment (ACRE) concluded that the trial will have no adverse effect on human health or the environment. Defra has set precautionary conditions to ensure that no GM material will enter the food chain.

In 2011 Defra authorised Rothamsted Research to plant its GM aphid-resistant wheat in spring 2012 and 2013. Extending the trial will enable further data to be obtained on the performance of the GM wheat later in the year, under different weather conditions and against different aphid populations.

Further background on the Rothamsted Research application, the statutory consent and ACRE's advice can be found at Genetically modified organisms applications and consents.

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https://www.gov.uk/genetically-modified-organisms-applications-and-consents

Updated 2 August 2013

Updated the information about how to access the GMO Public Register.

2 August 2013 18:18

Updated with 11/R8/01: Rothamsted Research details

13 June 2013 11:10

Added current consents and updated consultation of 11/R8/01

20 May 2013 14:47

First published.

16 April 2013 12:43

- Department for Environment, Food & Rural Affairs

Genetically Modified Organisms: applications and consents

Information about the release of genetically modified organisms (GMOs) for research purposes application and consent process.

Contents

To protect human health and the environment and ensure consumer choice, there is strict legislation controlling the deliberate release into the environment of genetically modified organisms (GMOs).

Consents for release of genetically modified organisms for research purposes are granted by the Secretary of State under the Environmental Protection Act 1990, Section 111 and 112 and the Genetically Modified Organisms (Deliberate Release) Regulations 2002.

This list covers the UK and includes consents granted by ministers in the Devolved Administrations. Details of all release consents can be found on the statutory GMO Public Register. Please contact gm-regulation@defra.gsi.gov.uk for further information.

Applications

All new applications go through a consultation to invite comments on the risks of damage being caused to the environment by a release. Defra currently has no applications under consideration.

Further detail on consultations of new applications

Paper copies of representations, unless otherwise requested by authors, will be made available for inspection. If you wish your representation to remain confidential please state this clearly when submitting your representation. Defra will acknowledge receipt of representations but replies to individual representations will not be given.

Under Regulation 20(b) of the Genetically Modified Organisms (Deliberate Release) Regulations 2002, on receipt of an application to release a GMO, the Secretary of State must invite the public and others to make representations to him on any risks of damage being caused to the environment by the proposed release.

The invitation is placed on the Public Register and repeated here on this website.

The period within which representations should be made has been set at a mandatory minimum of 48 days (the 48 day period comes from the fact that details of Part B applications must be placed on the public register within 12 days of receipt (Regulations 11, 34(3) and 35(2)) and that the period of consultation must not end less than 60 days from the date the application was received (Regulation 20(b)).

Consent cannot be refused or granted before the period of 60 days has elapsed, beginning on the day on which the application was received (Regulation 21(2)), but the latest date for a decision to be made is before the end of a period of 90 days after receipt of the application (excluding any time where additional information is being awaited; or any time when the secretary of state is considering the representations submitted to him so long as this does not exceed 30 days). For this reason any comments received after the above date may not arrive in time to be considered before a decision is made on the application.

Consents granted to release genetically modified organisms

List of all current UK consents for the release of genetically modified organisms for research purposes.

Each consent granted will include:

- Consent letter (confirming consent and outlining any conditions)
- Part A(1): Information required under schedule 1 of the Genetically Modified Organisms (Deliberate Release) regulations 2002.
- Part A(2-6): (If applicable) Details of related previous releases, including any data, results and risks.
- Part B: Information about the release application to be included on the public register.

This list includes consents granted by ministers in the Devolved Administrations.

11/R8/01: Rothamsted Research

Consent documents:

- 11/R8/01: Consent variation (8 June 2013)[PDF, 223KB, 8 pages] and 11/R8/01: Consent variation covering letter (8 June 2013)[PDF, 131KB, 1 page]
- 11/R8/01: Part A1 (updated 2013)[PDF, 833KB, 34 pages]

- ACRE's advice (updated 5 June 2013)
- 11/R8/01: Consent variation (16 March 2013)[PDF, 137KB, 2 pages]
- 11/R8/01: Consent variation (21 April 2012)[PDF, 89.9KB, 7 pages]
- 11/R8/01: Consent (15 September 2011)[PDF, 126KB, 8 pages]
- 11/R8/01: Part A1 (2011)[PDF, 815KB, 33 pages]
- 11/R8/01: Part B[PDF, 107KB, 3 pages]
- ACRE's advice (5 September 2011)

Farmers Guardian news

http://www.fwi.co.uk/articles/22/05/2012/133045/rothamsted-scientist-tackles-gm-wheat-questions.htm

Rothamsted scientist tackles GM wheat questions

Toby Bruce

Tuesday 22 May 2012 09:01

The GM wheat trials at Rothamsted have hit the headlines, but what are the researchers hoping to achieve and how? Senior research scientist Toby Bruce explains

Why are you focusing on controlling aphids?

Cereal aphids, such as Sitobion avenae and Rhopalosiphum padi, are well-known insect pests of wheat. They suck sap from the plant and drain it of nutrients. They also transmit barley yellow dwarf virus and can lead to fungal infection. Insecticides have been the mainstay of crop protection against these pests and have provided effective control. However, farmers face pressures from consumers, supermarkets and the EU to minimise insecticide use. Furthermore, overuse of insecticide can lead to a build-up of insecticide resistance.

To achieve food security for a growing global population, it is important to reduce losses to cereal harvests caused by pests. These losses mean that the resources (land, water and fertiliser) used by agriculture are wasted and more are needed to produce the same amount of food. Preventing losses to pests makes

agriculture more efficient and reduces its environmental impact. For these reasons it is vital we develop new solutions for crop protection.

What is the purpose of the plot trials and how do plants repel the aphids?

The GM wheat trial at Rothamsted is a small plot field experiment designed to test if new wheat plants, engineered to emit an aphid repellent, have lower aphid infestations under real field conditions. The plants emit a smell which aphids do not like. It is a signalling chemical called the alarm pheromone and is naturally produced by aphids when they are attacked by a predator to warn other aphids.

When they smell it the aphids run away. Furthermore, it also attracts natural enemies such as parasitic wasps and ladybirds which attack the aphids. By utilising these signalling chemicals (also known as semiochemicals), we are using a non-toxic approach to crop protection and we are making the crop environment more attractive for natural enemies of the pests. This contrasts with conventional control in which natural enemies are often killed by broad spectrum insecticides.

How was the gene introduced to the wheat plants?

The team at Rothamsted designed a synthetic gene construct encoding production of the aphid alarm pheromone which was based on a gene from peppermint plants. It allows plants to produce the repellent smell, (E)-β-farnesene. The gene was inserted into the wheat cultivar "Cadenza". This was done by coating the gene onto the surface of very small gold particles which were shot into wheat cells using a device called a gene gun.

How do the plants differ from conventional ones?

The GM plants look exactly like the "Cadenza" they were derived from, albeit that they smell different. Chemical analysis has shown that the GM wheat plants produce very pure aphid alarm pheromone. For repelling aphids this is better than the peppermint plant itself, which produces other smells that reduce the aphid response. Laboratory experiments have shown that the GM wheat repels aphids but that foraging parasitic wasps prefer the GM plants. While this is encouraging, the plants need to be tested under real conditions in the field, which is what we are doing now.

What area of GM crop is being grown and how is it being managed?

The plants were sown on 22 March this year. The trial is quite small, with a total area of 80m x 80m including non-GM controls and spacing between GM plots. It has eight 6 x 6m plots of GM wheat and eight plots of non-GM "Cadenza". Standard fertiliser, herbicide and fungicide applications will be made, but no insecticide will be used in the trial. Field experiments will be repeated again in 2013.

What precautions have you had to put in place?

Because this is a GM crop we had to apply for permission from ACRE (the Advisory Committee on Releases to the Environment), the regulatory authority for permission. As part of that process we had to carry out a thorough risk assessment, details of which are available on the ACRE website. ACRE said it was "satisfied that all appropriate measures have been taken to avoid adverse effects to human health and the environment from the proposed release".

How are you ensuring there is no cross-contamination of pollen or seeds to crops outside the trial area?

The probability of seeds moving from the trial site or the transfer (via cross-pollination) of inserted characteristics to sexually compatible species outside the trial area is estimated as very low. Wheat seeds and wheat pollen grains are relatively large and not normally dispersed by wind. The GM plots will be separated from the edge of the trial by a "pollen barrier" of wheat that helps to contain pollen from the GM plants within the trial site. All these plants are treated as though they are GM and harvested/destroyed at the end of the trial.

There will be no cereals grown for 20m outside the boundary of the site and no wild relatives of wheat that can cross with our cultivated variety exist in the vicinity. In addition, we have put in place strict management procedures to minimise the spread of seeds or pollen. Couch grass species - distant relatives of wheat - will be controlled in a 20m-wide area around the trial site to avoid any slight possibility of cross-pollination. We will ensure that suitable measures are in place to keep pigeons and other large birds out of the trial site during and after sowing and at the first signs of emergence of wheat ears.

Do you see this trait being commercialised and what benefits could it offer growers?

It would be premature to speculate about commercialising the crop because we first need to get the results of the trial to find out if the plants do control aphid pests under real field conditions. If successful, these plants could provide a possible alternative to insecticides and a non-toxic eco-friendly approach to pest control. However, we are taking it a step at a time and the next step will be to assess aphid infestation in the field. We are not growing a commercial product, but instead conducting a scientific experiment.

If the experiment gives us data suggesting that there may be viable environmental benefits to this type of genetic modification, then further experiments could be conducted to make a similar modification more like a commercial product. To produce a commercially viable crop that can repel aphids and is fit for human consumption requires further experimentation and regulation, which is way down the road and not the main purpose of this specific experiment at this stage.

http://www.farmersguardian.com/home/latest-news/defra-approves-rothamsted-gm-wheat-trial-extension/56327.article

Defra approves Rothamsted GM wheat trial extension

13 June 2013 | By Alistair Driver

DEFRA has approved the extension of Rothamsted Research's genetically modified (GM) wheat trials this autumn.

Rothamsted scientists sowed wheat plants which have been genetically engineered to produce an aphid alarm pheromone to repel the pests in the first stage of a two-year field trial last spring. The scientists said the plants would cut the amount of insecticides currently being used on crops.

Earlier this year, Rothamsted submitted an application to extend the field trial to include additional autumn-sown cadenza wheat.

The application was assessed by the independent advisory committee on releases to the environment (ACRE), and by members of the public through a 60-day consultation period.

ACRE has concluded that the trial will have no adverse effect on human health or the environment, paving the way for Defra to give the green light for the extension.

The Department said it has set 'precautionary conditions' to ensure that no GM material will enter the food chain.

Defra initially authorised Rothamsted Research in 2011 to plant its GM aphid-resistant wheat in spring 2012 and 2013.

It said extending the trial would enable further data to be obtained on the performance of the GM wheat later in the year, under different weather conditions and against different aphid populations.

Commenting earlier this year, Rothamsted researchers said the extension of the experiment would further increase the relevance to UK farmers and those in other temperate climates by covering a greater range environmental variability.

Research leader Professor John Pickett said: "With the trial up and running, it seems sensible to make this small adjustment. Autumn infestations of aphids are a real problem too, especially with the varied weather we are having.

"These additional data will add a great deal of value to the overall investigation by testing our wheat plant under a more varied range of environmental conditions throughout the year and in accordance with the different times of the year farmers plant their wheat."

The autumn extension to the trial will be sown in mid-September and destroyed after 10-12 weeks in late November or late December, depending on the weather.

The research centre mounted a robust public response when it was targeted by anti-GM activists last year.

Rothamsted research director, Professor Maurice Moloney said: "We worked hard last year to engage the public and listened to their views. The more data we can gather, the more evidence we will be able to obtain for Government and society to make decisions whether they wish to explore this next generation GM technology further."

GM Freeze campaign director Pete Riley said: "GM Freeze is disappointed that the Government has given the go ahead for this trial. There are far more important areas of research that could really use this public money, such as restoring UK soils. There is no market for GM wheat anywhere in the world, so why spend public money on a crop on one wants?"

Speaking at Cereals 2013, Farming Minister David Heath said, while GM is not 'the be all and all' of the Government's imminent agri-tech strategy, it does play a part.

"A large part of the world has been using GM applications for a long time and from what I can see, Americans are not dead," he said

NFU deputy president Meurig Raymond said there is a need for another 'green revolution'. "When we analyse the past 20 years, yields seem to have plateaued," he added. "We need another green revolution, and I'm convinced that biotechnology can help deliver some of that revolution."

Defra Secretary Owen Paterson is set to make a speech on GM crops next week announcing the Government's intentions to start a new debate within Europe on the technology.

He is keen to see restrictions relaxed to make it easier for GM crops to be grown in the UK.

Last week the universities and science minister, David Willetts, made similar comments at the Cheltenham science festival, saying, according to the Guardian, that GM could make farming more 'efficient' and 'sustainable'. He said the EU should ease restrictions on GM crops to avoid 'becoming a museum of the 20th century'.

http://www.farmersguardian.com/home/arable/aristocratic-eco-warrior-charged-over-gm-wheat-vandalism/47126.article

Aristocratic eco-warrior charged over GM wheat vandalism

22 May 2012 | By Alistair Driver

A 50-YEAR-OLD aristocratic eco-warrior who caused 'significant damage' to the UK's first genetically modified (GM) crop wheat trial has been charged with criminal damage.

Hector Christie, of Tapeley Park Lodge, Instow, in Devon, will appear at St Albans Central Magistrates Court on July 13, Hertfordshire police said.

Mr Christie, an old Etonian and the son of Sir George Christie, head of the Glyndebourne opera family, has been described as an eccentric and well-known anti-globalisation campaigner.

His actions on Sunday morning, when he caused what the Rothamsted Research institute described as 'significant, random property damage' have been condemned by scientists, politicians and farm industry leaders.

NFU president Peter Kendall likened GM activists targeting the trial to Nazis in the 1930s in a speech on Monday.

Local MEP Vicky Ford has joined the condemnation, describing the 'mindless and ill-informed act' as 'bad for British science and bad news for fight against food poverty'.

Mrs Ford had visited the trial of wheat modified with a gene which naturally occurs in spearmint to produce a smell that repels aphids such as blackfly and greenfly, on Friday. She sought to address some of the concerns raised by activists who are threatening to destroy the trial.

Mrs Ford, Conservative MEP for eastern England, said: "So-called campaigners have targeted this trial, claiming that pollen could cross-contaminate wheat in nearby fields. This is completely inaccurate as wheat self-pollinates.

"I saw for myself how the crop was being grown at least three times the distance from other crops set by regulators. The wheat was also protected with barrier-planting to prevent wind carrying the pollen.

"Britain has some of the strongest regulation on the planet for trails like this, but actions like this just mean scientists move their research programmes overseas to less-regulated countries."

She said people who are care about the environment should be pleased that scientists are seriously looking at ways to reduce pesticide usage.

Rothamsted said the intruder had not caused sufficient damage to disrupt the trial. However, it faces a much bigger threat on Sunday (May 27) when a group calling itself Take the Flour Back is planning a day of action at the site, including a 'decontamination'.

Rothamsted said Sunday's attack was consistent with the threats made by Take the Flour Back, although Mr Christie does not appear to be directly connected to the group.

Eleanor Baylis, from Take the Flour Back, said the group had 'no information about this incident, but are relieved if the quantity of GM pollen released from the trial has been reduced'.

A Defra spokesperson said GM crops could 'offer benefits, but are just one tool that could be employed to tackle the challenges of global food security'.

"Protecting consumers and the environment is our top priority and we're permitting a tightly-controlled, small-scale scientific trial in which none of the wheat will enter the food chain," he said.

Readers' comments (15)

- John Wayne | 22 May 2012 12:10 pm

  so a guy who hacks a few plants is compared to a regime that caused the deaths of well over 60 million people .The NFU will be taunted in the press for that . GM is nothing but bad news and humans playing with nature will always lead to big trouble

  Unsuitable or offensive? Report this comment

- Anonymous | 22 May 2012 1:52 pm

  In fact Christie is rather more than an "aristocratic eco-warrior" - he is a farmer who grows grains and other crops. I wonder why he is characterised in this way - on a par perhaps with TV and media reports that try to portray GM-skeptics, including scientists, as bearded hippies, mavericks, or 'mere' housewives.

  Unsuitable or offensive? Report this comment

- algernon | 22 May 2012 2:17 pm

  I do not believe that vandalism is a useful tactic, but imho this article is a clear example of the biotech corporate agenda (supported by government) to "engineer the consent" of the people to GMO seeds by steadfastly ridiculing those who oppose it.

  The mass proliferation of GMO seeds via a still infant science is irresponsible and dangerous. The People are right to peacefully resist. And they are right to resist the corporate hegemony of the world seed supply by multi-national chemical giants like Monsanto.

  Bottom line, follow the money. That path to truth always works.

  Unsuitable or offensive? Report this comment

- Filbert Cobb | 22 May 2012 2:39 pm

  If wheat shed viable pollen to any significant degree, production of certifiable wheat seed would be impossible in the UK.

Any ridicule is deserved in this case.

Unsuitable or offensive? Report this comment

- Peter | 22 May 2012 10:24 pm

  Kendall is showing his total ignorance with that Nazi comparison..... Also Christie has been portrayed as an excentric... he is a farmer and those that dismiss the GM issue are positioning themselves excentre. Does Montsanto perhaps sponsor this site??

  Unsuitable or offensive? Report this comment

- Anonymous | 23 May 2012 9:18 am

  The Nazis villified a section of the popullation and persecuted them.
  I dont see this campagner perscuting anyone - he's only destroying some mutated plants.
  Most people will applaud his actions.
  Seems to me both Peter Kendall and VIcky Ford are doing the villification. How about showing people views, livelihoods and concerns some respect rather than riding rough shod over their lives - like the Nazis ? Is either Peter or Vicky going to repair the damage if the trial goes out of control ? No - I thought not.
  Mr Kendall is leading farmers into a trapped co-existance with the likes of Monsato, can he please explain to his members exactly what he thinks he is doing ?

  Unsuitable or offensive? Report this comment

- D Pardoe | 23 May 2012 10:22 am

  There is a simple calculation to be done here. Do you a) want to allow plant breeders to use GM to bring plants to market quicker to keep up with population growth, or b) see worldwide famine on a scale only contemplated by the most pessimistic of Sci-Fi writers when the world reaches the crunch point where it can no longer grow enough food to support the population? Those are the two options PICK ONE.

  Unsuitable or offensive? Report this comment

- Richard Micklethwait | 23 May 2012 12:46 pm

  The biggest concern with GM is yhe abuse by companies promoting it.
  Monsanto was reported on Russian TV (English language) that in a trial mice were fed GM grain.They developed a thickening in their throat, a possible indicator of cancer. The trial was cancelled so the result would not be published.
  When genes of an Artic cod are put into a tomato to make it frost ressistant, do we trust the companies to really know the outcome and any side effects

  Unsuitable or offensive? Report this comment

- Anonymous | 27 May 2012 5:36 pm

This is David versus Goliath, enlightened thinking versus the corporate self-interested agri-business machine. Go Hector!
Take The Flour Back are totally on the right path regarding our future food production needs, and more in line with how increasingly many of us feel about science hijacking better more natural farming methods.
Big Agriculture and its depleting ways is not good for the planet, between the EU, scientists, politicians and self-interested agri-business corporations the whole food-chain is based upon industrial non-sustainability with money and power at the heart of it.
The Green Revolution of the 1960's and 1970's was supposed to end food scarcity, but all it's delivered is a corn-based diet for both humans and animals that has managed to give us increased ill-health (cancers, heart-disease, diabetes etc).
Anti-globalisation is a most sensible and sustainably minded stance. All globalisation has managed to do is bankrupt the West, reward a few transnational bosses extremely well and put pressure on 'the system' to rape the planet even more so.
Hector is right. Put him in charge of the NFU.

Unsuitable or offensive? Report this comment

- John Hirst | 28 May 2012 0:08 am

OK, facts will never display ignorance and prejudice; But let's try.
1. GM is not exactly an "infant" science. It's been practised in the field--not just the laboratory--for well over 15 years. Notably in North and South America
2. Hundreds of millions of people have eaten GM foods. Yet in all that time , there is no reliably recorded instance of any human being suffering from so doing.
3. Most of the propaganda about cross-pollination, "Frankenweeds", etc etc has turned out to be false.
Merely for the record, the notion that "The Green Revolution of the 1960's and 1970's was supposed to end food scarcity, but all it's delivered is a corn-based diet for both humans and animals that has managed to give us increased ill-health (cancers, heart-disease, diabetes etc)" is not just false, it's imaginative but entirely ignorant poppycock.

http://www.farmersguardian.com/home/arable/rothamsted-looks-to-extend-gm-wheat-trials/54381.article

Rothamsted looks to extend GM wheat trials

25 March 2013 | By Olivia Midgley

NEW GM wheat trials could get underway at Rothamsted Research later this year if plans are given the green light by Defra.

The centre in Harpenden, which was attacked by anti-GM protesters for its aphid resistant wheat trials last year, has submitted an application to extend its current field trial to include additional autumn-sown cadenza wheat.

Scientists believe it would be ‘advantageous’ to gain further data from their experiment, in wheat planted at a different time of year and under different weather conditions with different aphid populations.

Because the UK’s temperate climate permits wheat plant growth during the winter, Cadenza wheat can be sown in either the autumn or the spring and both sowings are harvested in August/September.

Researchers say the extension of the experiment will further increase the relevance to UK farmers and those in other temperate climates by covering a greater range environmental variability.

Research leader Professor John Picket said: “With the trial up and running, it seems sensible to make this small adjustment. Autumn infestations of aphids are a real problem too, especially with the varied weather we are having.

“These additional data will add a great deal of value to the overall investigation by testing our wheat plant under a more varied range of environmental conditions throughout the year and in accordance with the different times of the year farmers plant their wheat.”

The autumn extension to the trial will be sown in mid-September and destroyed after 10-12 weeks in late November or late December, depending on the weather.

Rothamsted research director, Professor Maurice Moloney added: “We worked hard last year to engage the public and listened to their views. The more data we can gather, the more evidence we will be able to obtain for Government and society to make decisions whether they wish to explore this next generation GM technology further.”

The application will be assessed by the independent advisory committee on releases to the environment (ACRE), and by members of the public through a 60-day consultation period.

Email defra.library@defra.gsi.gov.uk.

Readers' comments (1)

- Anonymous | 26 March 2013 3:53 pm

  • Why are these trials necessary? We know from the reports coming out of the US that insect resistance to GM crops develops quickly.
  • What is the point? 12 weeks of growth is unlikely to yield any useful data, and surely a full season of growth would be more informative.
  • Solutions to aphids are already available- it isn't the major headache for farmers that Rothamsted makes out.
  • Money for research into how to repair water-logged soils would be more beneficial to farmers right now.
  • Both Rothamsted and the BBSRC have revealed that this is now a five year project, despite earlier reports of it only running for two. Why does the story keep changing?