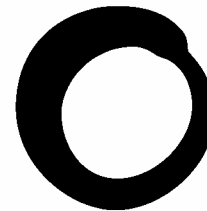


Briefing Note



**Friends of
the Earth**

GM FODDER MAIZE

Why ChardonLL should not become the UK's first commercial GM crop

The Government is expected to give commercial approval to GM fodder maize – ChardonLL – in the very near future despite public opposition, scientific uncertainties and the absence of any demand for the crop in this country. If this happens it will be the first GM crop to be commercially grown in the UK. This briefing explains some of the background to ChardonLL and highlights some of the reasons why this GM maize should not be given the commercial green light.

ChardonLL - Background

ChardonLL, a type of GM fodder maize developed by Bayer CropScience (formerly Aventis), was trialed in the Government's GM Farm Scale Evaluations (FSE). It contains a "T25" transformation making it tolerant to the herbicide Liberty (glufosinate ammonium). T25 maize received European marketing consent in 1998 but has not been grown commercially anywhere in Europe.

In February, a leaked Government memo revealed that the Government intends to give commercial approval to GM maize provided it is grown in the same way as it was in the FSE. An announcement is expected within days.

Before ChardonLL can be commercially grown it must be placed on the National List of Varieties (Seed List)¹. For this to happen, agreement is needed from the UK's four administrations (UK Government, Scotland, Wales and Northern Ireland). If one fails to agree, ChardonLL cannot be listed and is unlikely to be sold to farmers in the UK. The Welsh Assembly, which has a policy of protecting organic and conventional crops from GM contamination, currently appears to be particularly reluctant to give its agreement (see Seed List Hearings below).

Approval for the associated herbicide Liberty (glufosinate ammonium) to be used on the GM crop is also needed from the Pesticides Safety Directorate (PSD).

Why ChardonLL must not be given commercial approval

1. The Farm Scale Evaluations of GM maize were fatally flawed.

The Farm Scale Evaluations were set up to test *"that there are no significant differences between the biodiversity associated with the management of GM fodder maize tolerant to the herbicide glufosinate ammonium and comparable non-GM fodder maize at the farm scale"*.

The results of the four year trials, which were published at the end of 2003, showed that the pesticide regimes used on GM oil seed rape and GM beet caused more harm to farmland wildlife than the pesticides used with their conventional counterparts. But in the case of GM maize a different conclusion was reached. The FSE results appeared to show that GM maize, which used the herbicide Liberty, was slightly less damaging to farmland biodiversity than growing conventional maize sprayed with atrazine.

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But these results are widely regarded as being fatally flawed:

a. The EU has now banned atrazine

Atrazine and related products will be banned in the EU from 2006 because of its damaging impacts on the environment. So it is little wonder that GM maize was found to be less damaging in the FSE. There is no data to show how GM maize compares with conventional maize sprayed with the herbicide that will replace atrazine. English Nature, the Government's wildlife advisor, has called for this data to be available before final commercialisation decisions are made, and there have been some calls for the GM maize trials to be re-run (which could take a further three to four years).

b. Commercial yield doubts

There are serious concerns that the GM maize in the FSE was not grown in a way that produced commercial yields. Maize is extremely susceptible to early weed competition, but Bayer advised some farmers to delay application of the weedkiller on the GM fields. It is likely that biodiversity measurements were therefore enhanced at the expense of yield. However, there is no way of verifying this statistically, as the trials did not include an accurate measure of yield or maturity. Instead, estimates were taken by farmers hosting the trials and height was measured - a poor surrogate for yield. Friends of the Earth has evidence from one maize trial in Oxfordshire that reveals that weed presence in the GMHT maize resulted in a crop that was estimated to be about six times less productive than the conventional maize grown².

c. Growing GM maize in the USA often uses extra herbicides

Evidence from the USA suggests that farmers often use additional herbicides when they grow GM maize. In the FSE, only glufosinate ammonium was used, but information from US maize growing areas shows that, on its own, weed control with glufosinate ammonium is "*poor to fair*"³ and that 75-90 per cent of farmers growing GM maize use a Bayer product containing a mixture of atrazine and glufosinate (Liberty ATZ)⁴. During the four years of the FSE, Bayer neglected to inform DEFRA that it sold the herbicide in the US in this mixture (until the issue was raised by Friends of the Earth), so only glufosinate was used in the trials. As atrazine is being banned in the EU, this mixture would not be available in Britain.

d. The FSE compared two unsustainable management systems

There has been concern about the way conventional maize is grown for a long time. Problems include pollution of water courses and groundwater by manures, fertilisers and pesticides, soil erosion and nutrient pollution of air and water⁵. So the Farm Scale Evaluations were simply comparing two unsustainable and damaging methods of maize production. Friends of the Earth is not calling for more trials. A comprehensive review of all aspects of maize cultivation is needed to drastically reduce its environmental impact.

2. Concerns about the GM maize herbicide: Liberty (glufosinate ammonium)

There are also doubts about the safety of "Liberty"⁶. Early approvals of the herbicide in the 1990s (pre-GM), restricted its use to the summer months because of concerns about leaching into surface and groundwater in the heavier winter rains⁷.

Friends of the Earth has attempted to access the data on the potential for Liberty to leach from the soil, submitted by Bayer to gain approval for use on winter oilseed rape. However, Bayer has objected to this data being released and has taken legal action to stop the Pesticide Safety Directive releasing the information to Friends of the Earth. Eventually access to the data was allowed on a "read only" basis following an out of court settlement.

Concerns about Liberty include potential:

- damage to the nervous system.
- damage to beneficial soil microbes.
- damage to some aquatic invertebrates

Anxieties are more acute in GM maize production as "Liberty" is sprayed directly on to fodder maize plants creating the potential for residues in milk and meat.

3. Risks of cross-pollination

Maize is a wind pollinated crop which has been shown to cross-pollinate over considerable distances⁸ well beyond the maximum 200 metre voluntary separation distance required by the FSE. Previous research is supported by DEFRA results showing that cross-pollination at 0.14% had been found 650 metres from a FSE maize trial⁹. If GM maize is commercially grown, cross-pollination is likely to be frequent, undermining the ability of farmers to produce GM-free or organic food, and reducing the ability of consumers to avoid GM-food.

4. ChardonLL does not perform well in Britain

For a seed to be added onto the UK Seed List, it must demonstrate value for cultivation and use (VCU). VCU includes a requirement that it should represent an improvement on existing varieties and not harm people, plants or the environment. However, the raw data for cob ripeness shows that ChardonLL performed very badly and never scored better than any other variety even when harvested late. In addition, the VCU trials were conducted without the use of its associated herbicide, Liberty, so do not represent the conditions in which the crop would be commercially grown.

Furthermore, value for use cannot be shown as no tests have been published to establish that ChardonLL is safe to be fed to cattle, which is its only intended use. Value for use (as opposed to cultivation), had not even been tested.

5. Question marks over the safety of ChardonLL

Friends of the Earth has consistently highlighted the poor quality of the scientific evidence used to obtain the European marketing consent for T25 maize (of which ChardonLL is one variety), as revealed in the Seed List Hearings¹⁰ (see below). The only feeding study to look at the impact of feeding animals T25 maize was severely criticised for its poor science - but found that twice as many broiler chickens died after being fed T25 maize kernels, compared with a non-GM variety. No feeding studies were carried out on cattle - the only proposed use of ChardonLL is as cattle feed.

T25 maize gained its approval for food use through a 'fast track' route, for which Aventis/Bayer relied on a report produced by the UK's Advisory Committee on Novel Foods and Processes (ACNFP), in 1996. The committee hadn't even seen the chicken study when they gave a favourable opinion. The Chair of another UK Government Advisor, ACRE, subsequently admitted that the tests were not good enough to adequately assess the risks involved¹¹.

6. There is no public support for GM food or crops

Over recent years, supermarkets and food manufacturers have been forced to ensure that their food products don't contain any ingredients (or derivatives, such as refined vegetable oils) from GM crops as a result of overwhelming public opposition.

In 2003 the Government launched a nationwide GM public debate called *GM Nation?* When it reported in September, it was revealed that more than half (54 per cent) never want to see GM crops grown in the UK, a further 18 per cent would find GM crops acceptable only if there was no risk of cross-contamination, and 13 per cent wanted more research before any decision was made. Only two per cent said that GM crops were acceptable "in any circumstances" and only eight per cent were happy to eat GM food (86 per cent were not)¹².

The debate organisers also conducted a series of separate interviews with groups of people, representative of the general population, who didn't take part in *GM Nation?*, to see if there was a "silent majority" with different views from those taking part in the debate. The results of this "Narrow But Deep" research "suggested that when people in the general population become more engaged in GM issues, and choose to discover more about them, they harden their attitudes to GM". This included "more concern/greater unease about all the risks most frequently associated with GM. In particular, the more they choose to discover about GM, the more convinced they are that no one knows enough about the long-term effects of GM on human health."

Throughout the debate, the Government refused to say how it would incorporate the results into GM decision-making. Given the recent leaked minutes showing the Government keen to push ahead and overcome public opposition, the public would be justified in asking what the point was of seeking its views on GM food and crops if the Government was going to give commercial approval regardless.

7. There is little economic justification for growing GM crops.

The Government commissioned a report on the economics of GM crops as part of its GM Nation debate. The report, published by the Number 10 Strategy Unit, concluded that there is little economic value in the current generation of GM crops, and that continuing public opposition would also affect their long-term future¹³.

There is no demand for GM crops in the UK. Food manufacturers have been forced to take steps to ensure that their products are GM-free; many have also adopted measures to make sure that meat and dairy products come from animals reared on non-GM diets (GM animal feed will have to be labelled from April 2004 if traded off-farm). Introducing GM maize into the wider environment will increase the risk of GM contamination and force companies to adopt more stringent and costlier methods to maintain their GM-free policies to satisfy public demand.

8. Incomplete GM science

The Government's GM science review, the third strand in the Governments' GM dialogue which published its final report in January 2004, raised a number of questions about significant gaps and uncertainties in our scientific knowledge on the potential impacts of GM food and crops on our health and the environment. For example, it said that allergenic proteins, produced by the genetic modification process, could be missed by the safety tests, and that new consequences of plant breeding could be unexpected.

Seed List Hearings

In 2000, ChardonLL was proposed for addition to the UK Seed List, following two years of National List Trials to compare the variety with the current conventional maize seeds. This is one of the steps that must be taken before a seed can be commercially grown in the UK. The Government was forced to hold an official hearing after people demanded their right to object. More than 220 individuals and more than 60 organisations presented written and oral evidence from 2000-2002. During the hearing, expert scientific witnesses produced evidence casting severe doubt over the validity of allowing the seed to be listed (see above). The hearing report has been with the Government since October 2002¹⁴.

The decision to list ChardonLL is on the agenda again this year. If all four UK administrations agree to list the seed, ChardonLL objectors can appeal. And they are likely to do so and present evidence at a re-convened tribunal. The report of the tribunal would then be considered jointly by the four administrations of the UK, who will then make the final decision. As this process has only been used for a handful of decisions over the years, it is not possible to second guess the timetable. But it is almost certainly to extend beyond the end of May deadline for planting fodder maize in 2004.

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