

# The Farm Scale Trial crops GM maize, beet and oilseed rape

## Introduction

Outdoor trials of genetically modified crops at the “farm scale”, i.e. on the same scale as such crops might normally be grown on a farm, started in the UK in 1999. These trials continue this year at dozens of locations across the country - there could be one near you.

This briefing provides basic information about the crops being grown in the Farm Scale Trials (FSTs). Three crops are being grown: fodder maize, oilseed rape, and beet. The beet crop will consist of some trials of sugar beet and some of fodder beet. The oilseed rape will be grown in winter and spring varieties.

## Problems with GM

The large-scale growing of GM crops raises many concerns, such as:

- cross-pollination with native species
- contamination of organic crops
- contamination of conventional farm crops
- contamination of GM animal feed
- contamination of products such as honey

Not all of the concerns apply to every crop being trialled. For example, maize cannot cross with any wild plants in the UK, and there is little organic growing of either rape or beet.

This briefing only provides an outline of the issues for each GM crop being trialled. More information is available in other briefings from Friends of the Earth and

other organisations - contact details are given at the end.

## Need for research

Friends of the Earth is not anti-science, nor against research, but we do think that the public has the right to question what research takes place. We believe that these GM trials pose an unjustified risk to the environment.

We are calling for a five-year moratorium (‘freeze’) on large-scale growing of GM crops, until their effects are better understood. And we are calling for more research funding to be provided for all forms of sustainable agriculture (not just organics).

We also question whether the crops being trialled are really needed. Proponents of GM crops have claimed that GM technology will help alleviate world hunger. None of the Farm Scale Trial crops have any relevance for world hunger or poverty. All of them are herbicide-resistant crops designed to deliver crop-management benefits to farmers here in the developed world and financial benefits to the biotechnology companies that sell the herbicides and seeds.

## Maize

The GM maize being used in the FST is produced by Aventis (formerly AgrEvo), and is referred to as ‘T25’. It is resistant to the herbicide glufosinate ammonium (often known simply as glufosinate or under its tradename of Liberty) which is also made by Aventis.

This GM maize is the only one of the FST crops which

has marketing approval under EU law. This means that it can be planted anywhere, not just at test sites. Aventis do not have to tell the public or even the government where they are planting it, although they are doing so at the moment on a voluntary basis.

This maize is also very close to becoming the first GM seed variety approved for commercial growing in Britain. If it obtains this approval, then Aventis will be legally entitled to sell GM maize seeds to farmers - even before the end of the farm-scale trials if they wish to.

## Impacts on the soil

Glufosinate has been shown to be harmful to some beneficial bacteria and fungi that live in the soil. It could disrupt the micro-organism community within the soil, possibly affecting the health of following crops. Maize is often grown year after year in the same field so this is an important issue for farmers.

## Threats to other farmers

GM maize poses a threat of contamination, as the result of cross-pollination, for non-GM and organic maize crops. As well as this, the GM maize pollen could contaminate the honey of local bee keepers.

The guidelines under which the FSTs are being conducted lay down separation distances that must be maintained between the GM maize and any nearby fields of non-GM maize - whether grown for human consumption (sweetcorn) or for animal feed (forage maize).

For fields of sweetcorn or organic maize, the separation distance is 200m. For conventional fodder maize, the smaller distance of 80m is allowed.

These separation distances are inadequate, because pollen can be carried by bees for several kilometres, as research has shown. Organic growers will not be protected if bees pollinate their maize with GM pollen, meaning that they risk losing their license to sell organic produce, without compensation.

## Crossing to wild plants

Unlike the other two crops in the FST, maize does not have any close wild relatives in the UK, so in this case there is unlikely to be crossing to weed species.

## Alternatives to GM maize

Using herbicide resistant maize will not help more sustainable and environmentally friendly forms of agriculture. In contrast, there has been some research into mechanical weeding techniques, such as hoeing, in maize. Such techniques have been shown to be cost effective as well as cutting down on weedkillers.

## Oilseed rape

The GM oilseed rape is also made by Aventis, and is also resistant to glufosinate ammonium.

Oilseed rape is widely grown in the United Kingdom. It is used to produce food grade oil, with the pulp then being used in animal feed. The oil is commonly used for margarines and blended vegetable oils. No organic oilseed rape is currently grown in the UK.

## Dangers of the herbicide

The oilseed being used in the trials has been engineered to resist the herbicide glufosinate ammonium. Glufosinate is not widely used on oilseed rape, so any risks to the environment and human health from using this herbicide will be increased. Although glufosinate residues have been found in harvested oilseeds its presence is not tested for in oilseed products.

## Bees

Honeybees are the primary pollinators of oilseed rape, although the pollen also spreads on the wind. Oilseed rape fields are one of the biggest sources of honey in the UK.

The pollen from oilseed rape has been shown to spread over long distances. Studies commissioned by Friends of the Earth at a GM oilseed trial in Oxfordshire in 1999 found GM pollen in bee-hives 4.5 km away from the field.

Given a large nectar and pollen source, such as fields of rape in flower, bees tend to stick to that one source. Honey produced near GM test sites has been found to contain GM pollen.

## Crossing to other plants

Oilseed rape commonly spreads into other crops as a weed. These too will be resistant to glufosinate so they may have to be controlled using alternative herbicides.

Neighbouring fields of oilseed rape can cross breed easily. The GM oilseed will contaminate non-GM crops, leading to the possibility that the oil produced could contain GM material.

It is now known that GM contamination of oilseed rape can occur at a distance of at least 4km - this was admitted by Advanta Seeds in explaining how they imported GM-contaminated rapeseed into several European countries.

Oilseed rape has several close relatives which grow wild in the UK, with which it is able to crossbreed. Wild turnip is often found growing in fields of oilseed rape so this crossbreeding can happen very easily.

This means that the GM herbicide resistance gene could become incorporated into wild plants. The impact of this on wild and weedy plant populations is unknown. The prospect of common weeds becoming agricultural pests (often labelled as “superweeds”) is very real and may lead to more toxic chemicals being used to control them.

## Fodder and sugar beet

The beet crops being grown are resistant to Monsanto’s herbicide glyphosate (RoundUp). Beet is grown for its root which is used either to make sugar for human consumption, or as fodder for animals. Both types of beet are being grown in the FSTs.

Beet has been bred so that it normally flowers in the second year of growth after creating a store of energy in its root. Since they are normally harvested before flowering, growers claim there is no danger of cross-pollination from crops of GM beet.

However, in any field of beet a proportion of plants ‘bolt’, i.e. they produce flowers early, in their first year. These bolters are often controlled by hand weeding, or by herbicide applied only to the bolting plants.

This is normal farming practice, but typically not every bolter will be removed so there is a risk of pollen being produced. Beet pollen travels extremely long distances. A study by the Institute of Terrestrial Ecology found that wild beet populations can cross breed at a distance of 14 km.

A French field study of gene flow in GM sugar beet found hybridisation occurring in neighbouring fallow fields where weed beet was growing.

‘Weed beet’ is a weedy version of the beet plant which is very common in and around fields of beet crops. In addition, the wild plant ‘sea beet’ grows wild along most

of the coast of England and Wales. The GM crop will cross readily with either if allowed to produce pollen.

Because the GM trials are being so closely watched, we expect the participating farmers to be extra careful to remove bolters in these fields. But under normal growing conditions, such extreme care is unlikely, so pollen spread from GM beet crops is still a concern.

Finally, there is the possibility of genetic pollution without the need for pollen. Some soil bacteria have been shown to be able to ‘pick up’ genes from GM plants a process referred to as ‘horizontal gene transfer’. This is a new issue that has hardly been investigated and the implications are unknown.

## Animal feed

All of the maize crop and most the beet is being grown as food for animals. The government has repeatedly said that the produce from the trials will be kept segregated from non-GM produce, but have not made clear how this can be achieved with the meat or dairy products from animals fed on the crops.

At present, the European Union (EU) does not require an assessment of the safety of GM crops for animal feed. A Regulation covering this issue has been under discussion within the EU since at least 1994, but still nothing has emerged. Commissioner Byrne, responsible for health and consumer protection, has referred to the novel feeds proposal as “*the missing link in Community legislation on GMOs.*”

Despite this lack of safety assurance, the government has said that produce from the FSTs will be allowed to enter the human food chain. Food retailers have started to respond to public demand for products derived from animals fed a GM-free diet. Most of the leading supermarkets have ensured, or are developing policies to ensure, that the meat and dairy products they sell come from animals fed a GM-free diet.

## Use of herbicides

The production of herbicide resistant seeds encourages farmers to look upon the use of herbicides as the first choice for weed control. Having bought the herbicide resistant seed, farmers would be far more likely to use the herbicide when before they might have considered this as only one possible option.

There are still a number of farmers who think that to

have any weeds at all in a field is a sign of bad farming, when in fact a certain level may have no adverse affect upon the crop. The ability to use non-selective herbicides in the crop will further promote this attitude and encourage the use of herbicides, rather than promoting the real needs of the crop.

Additionally, some weeds, if exposed often and long enough to a weedkiller, will adapt to this pressure and develop its own resistance. This may lead to stronger doses being required in the future.

Since 1969 the populations of skylark and grey partridge have fallen by 58 per cent and 82 per cent respectively and this has been blamed largely upon modern farming practices such as the widespread use of herbicides and other chemicals on crops. We should be looking to organic food production for real alternatives to the use of chemicals in farming.

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