ACNFP consideration of Greenpeace report on genetic modification.

ACNFP CONSIDERATION OF GREENPEACE REPORT ON GENETIC MODIFICATION

SUMMARY

Overall the ACNFP considers that the examples cited by Greenpeace demonstrate that the regulatory process is robust and readily identifies any untoward effects. Whilst making a strong case for continued vigilance the Greenpeace report provides no justification for changes to the current regulatory framework.

INTRODUCTION

1. The Greenpeace report written by Dr Parr (copy attached at annex 1) was sent to all ACNFP members by post. This response represents their collective views. Whilst the ACNFP's remit focuses on the food safety implications of GMOs, members were invited to comment on all aspects of the report.

2. The Greenpeace report consists of an introduction setting out the reasons why Greenpeace is opposed to the introduction of GMOs. This is followed by 12 case studies that are intended to underline the Greenpeace arguments about the unpredictable nature of GMOs.

3. In his introduction, Dr Parr suggests that 'science cannot make genetic engineering safe'. He then goes on to suggest that 'what is an acceptable risk is a matter of opinion - a matter of judgement, not a technical question?' However, crop improvement via conventional breeding, involving the utilisation of wild relatives and even different species in breeding programmes, introduces risk of insertional events, introduces large amounts of DNA, the effects of which in the food chain are not known, as well as many of the other possible hazards Greenpeace have discussed for GMOs. Thus the question arises, is the genetic

modification of crops more or less hazardous than conventional breeding? It can be argued that GM crops are less hazardous because:

(i) we can define what is put in in terms of the DNA sequence and we have some knowledge of where it goes;

(ii) the GMOs receive much greater levels of testing than the conventional varieties.

The important point is that the focus should be on the products *per se* and their risk rather than on the technology used to produce them.

4. The report suggests that the agricultural applications of GMOs involves the 'irreversible and uncontainable' release of GMOs into the environment. In practice most crop plants, whether they have been genetically modified or not, do not survive in the wild, this is particularly true of most cereals grown in the world today.

5. The report criticises the commonly quoted justifications for crop biotechnology. However, there is no mention of the fact that there are many millions of people alive today who would not have survived were it not for the massive improvements in crop yields brought about by the development of new agricultural technologies. Inevitably ensuring that food supplies keep pace with the growth in world population will involve a variety of other factors. However, keeping crop yields pegged at today's levels is not an option.

THE TWELVE CASE STUDIES

6. The report cites 12 case studies to justify the assertion that genetic modification is so unpredictable that it should not be permitted. However, the key question is whether the European regulatory framework is robust enough to deal with such incidents. Each case study is considered briefly below.

Case 1

The European regulatory system requires monitoring of trial sites during and following experimental releases. In the UK, the HSE inspects trial sites to ensure conditions of consents are complied with. There is some doubt about the conditions of the experiment referred to in this case study. Biotechnica International are known to add nutrient media to soil as part of their experiments. There is no indication that any harm occurred as a result of the trial.

Case 2

The reference to Monsanto's oilseed rape refers to two very similar lines of oilseed rape. In Europe, no seed, GM or conventional, can be grown commercially unless it appears on the Common Catalogue. Before seed is listed on the common catalogue, it must be shown to have a value for cultivation and be distinct, uniform and stable.

Case 3

The potential allergenicity of proteins expressed by novel genes is addressed as part of the safety assessment process. The Pioneer soya bean example demonstrates the effectiveness of existing controls. However MAFF and other

organisations are funding research to further refine methods for predicting the allergenic potential of proteins.

Case 4

Ethanol is used to kill microbes, it is hardly surprising that a bacterium producing excess ethanol affected the local microflora adversely. From the report it is not clear whether this experiment was carried out as a field trial or in a laboratory.

Case 5

The examples relating to the use of growth hormones have been rightly criticised for the unnecessary suffering inflicted on the animals involved. The controls imposed by the Animal Scientific Procedures Act ensure that animal welfare is given a higher priority in the UK.

Case 6

It is not clear whether the example quoted refers to a field trial or laboratory experiment. Certainly the fact that 2, 4-DCP was toxic is not altogether surprising.

Case 7

It is not clear whether the Dutch study involved GM or non-GM bacteria. The Greenpeace report suggests that there is a risk of contaminated laboratory coats acting as a vector for the spread of GM micro-organisms into domestic sewerage systems. However the contamination of lab coats is covered as part of the standard risk assessment required under the contained use regulations. Indeed it is standard practice to autoclave such coats before they are laundered.

Case 8

There is nothing very surprising with this example. Yeasts and other microorganisms are modified to alter metabolic pathways with the build up of a specific metabolite frequently being the intended end result. Where such organisms are intended for food use careful consideration is given to the possibility that levels of toxic metabolites might have been increased. This example again illustrates the effectiveness of existing safety assessment procedures in identifying such cases. It is interesting that much is made of the fact that this yeast produced elevated levels of methyl glyoxal, a compound that occurs widely in foods and beverages and has some mutagenic activity *in-vitro*, although of course yeast is also well known for producing significant quantities of ethanol. The International Agency for Research on Cancer (IARC) does not consider methyl glyoxal classifiable with respect to carcinogenicity but does consider drinking alcoholic beverages to be a clear cause of human cancer. The Committee on Carcinogenicity (COC) concluded that the risk of cancer associated with drinking alcoholic beverages was due to the consumption of ethanol.

Case 9

The Trypotophan case has been studied in great detail. It is of considerable interest to groups such as Greenpeace in that it is probably the only example where any serious adverse effects can be even indirectly attributed to a GMO. However, a closer examination of the facts reveals that the cause of the deaths associated with tryptophan had less to do with the source organism and more to do with a failure in quality control procedures. In this particular case the company had removed 3 key stages from the past production purification process including a crucial carbon filtration. The tryptophan incident illustrates the need for companies to put in place robust quality control procedures. This is an issue that

the ACNFP attaches great importance to and information on such procedures forms an essential part of the ACNFP's safety assessment process.

Case 10

As indicated in the response to case 2 a requirement for entry onto the Common Catalogue is that a new variety must be shown to be stable. Although colour fading of flower petals on prolonged exposure to light is a phenomenon observed in most flowers.

Case 11

This case illustrates the importance of ensuring that novel genes are stably integrated into the plant genome. This is a key aspect of the ACNFP's consideration. Indeed because there is currently little experience in predicting the effect of genetic drift on the metabolism of any lines of plants whether genetically modified or conventionally bred the ACNFP requires all applicants to provide periodic updates to substantiate the long term stability of GM lines. Again the particular example quoted shows no evidence of harm, indeed loss of the herbicide tolerance trait is self limiting.

Case 12

This example has nothing to do with the safety or otherwise of GM tomatoes. It is an example of how companies need to consider the commercial implications when developing any new product.

CONCLUSIONS

7. The Greenpeace report serves a useful purpose in demonstrating the need for continued vigilance by regulatory authorities. However, there is no sustainable justification in the report for a ban on the release of all GMOs into the environment. The report indirectly highlights the strength of the existing European regulatory framework in being able to ensure that activities involving GMOs do not cause harm to human health or the environment in Europe.