Report from the International Workshop on the ECJ Ruling on GM Pollen in Honey

John Durkacz, Markets Convenor for the Scottish Beekeepers' Association, attended the International Workshop on the consequences of the European Court of Justice (ECJ) judgement on GM pollen in honey held in Berlin on 13-14 December 2011. The report describes many of the presentations from experts, delegate responses and the attempts to find a way of managing the serious problems that this ruling presents to the world honey market. The final section contains some personal views which may not represent SBA opinion. The ECJ ruling has highlighted the issue of GMOs and will provide much discussion in the coming months.

Background

In September 2011 the ECJ ruled in a case where a dispute had arisen between an organic beekeeper and the local state department which owned several plots of land where MON 810 maize was cultivated for research purposes. Very small amounts of DNA derived from pollen of this genetically modified crop had been found in his honey. He claimed this made his products unsuitable for marketing and consumption. Earlier directives have stated that honey consists not only of different sugars but also of other substances, including solid particles derived from honey collection. Thus pollen has been traditionally considered as a normal component of honey and not as an impurity or foreign substance. However the ECJ has ruled that pollen from genetically modified plants contained in honey counted as a food ingredient and so required authorisation. One of the consequences of this 'reclassification' is that honey containing pollen of genetically modified plants now falls within the scope of GM regulations on food and feed. As a result honey containing GM pollen can only be placed on the market if the GM plant in question has been authorised as food and labelling requirements have been observed.

The reasoning of the ECJ on this matter is complex, difficult to grasp and had clearly exasperated many. Some considered that this was a 'senseless ruling out of touch with the most basic technical realities' but whatever our views we have to appreciate that this is a legal decision and coming from the ECJ cannot be appealed. There is a strong anti-GM lobby within the EU and this is especially apparent in Germany. The anti-GM lobby are delighted with this ruling as it seriously restricts the promotion of GM crops within the EU.

GM cultivation globally has steadily increased since 1996 with most crops grown in North America and a rapid expansion in developing countries in recent years. By 2010 some 48% of GM crops grown worldwide were from developing countries. There have been some remarkable success stories but also many instances where GM crops have failed to live up to earlier promise. In the EU consumers have been reluctant to recognise the benefits or accept the safety of GMO products despite careful assessments and the lack of scientific evidence of any risk to human health from GM foods. Consequently throughout Europe many regions have declared themselves as 'GMO free'.

As we live in a democratic society we must respect consumer opinion but at the same time be aware that some campaigning encourages irrational views on the perceived risks from GM foods. We now have a situation where a consignment of honey from a cooperative of beekeepers in a developing country risks destruction for no other reason than the presence of a tiny amount of GM pollen from an unauthorised plant. Some would regard such waste of food resources as unethical when there is no rational evidence to support a health risk.

Coexistence Measures

EU recommendations for the development of national strategies to ensure coexistence of GM crops with conventional and organic farming have been developed since 2003. The intentions are to avoid unintended presence of GMOs. A policy of 'subsidiarity' has been followed where the EC sets guidelines and Member States will take practical measures according to their circumstances. The

burden of responsibility has been shifted to the GM growers who have to notify their intentions and register. Guidelines on field separations must be followed. Database updates on land use become complex as the location of beekeepers and conventional and organic producers must all be known. This means that some regions may become GM free and other areas may develop GM zones. An EU labelling threshold of 0.9% is set below which the presence of GM material of authorised GMOs is accepted as adventitious or unintentional. However the food industry and organic producers have demanded a lower limit which was 0.3% and sometimes 0.1%. It is often the case that the costs and the administrative measures are a disincentive to GM adoption by farmers unless the benefits of GM crops are very clear.

How Pollen ends up in Honey

Pollen grains are dispersed widely in the environment as well as being collected by bees on their foraging trips. Foraging activities and distances that bees will fly depend on population size and the needs of the colony as well as the availability of plants in the environment. The foraging range is usually 1.5 to 2.0 km but sometimes 5.0 km and rarely more than 6 km up to even 10 km. Some pollen is present in large amounts in nectar as from rape. Pollen from lime trees is under represented. Pollen from flowers unattractive to honeybees can be dispersed by bumblebees entering flowers and the disturbed pollen may stick to honeydew secretions and subsequently be collected by bees and end up in the hives. (An example of this happening with potato flowers was cited by one of the researchers). It is possible for bees flying over fields of maize to have pollen stick to them as well as pollen to be blown into hive entrances under certain conditions. Pollen returned to the hive is stored close to the brood nest but bees walking over exposed cells of nectar may have pollen grains dislodged. During the extraction process pollen will end up in honey. It becomes obvious that pollen from considerable distances and many sources can finish up in honey.

Detection of GM Pollen in Honey

EC regulations require labelling of food ingredients from authorised GMOs. Therefore honey will require labelling if it contains 0.9% of pollen in relation to its total pollen content from authorised GMOs. Where pollen comes from GM plants which are not authorised for food then there must not be, even in trace quantities, any present in honey. It is not possible to differentiate by a microscopic analysis between conventional and GM pollen. With current quantitative real-time PCR analysis the percentage of genetically modified DNA sequences can be measured in relation to species specific DNA. However honey is a difficult matrix for DNA extraction because there are low overall amounts of DNA, pollen levels will vary in different honeys and there can be inhibition of the PCR amplification process. There may also be DNA present from other plant sources in the honey.

Initially the pollen yielded from an enrichment process is screened for the presence of genetically modified sequences. For unauthorised GMOs a qualitative PCR detection is sufficient. GMO presence with a general authorisation for food will have to be quantified and this is where difficulties arise. One presentation on honey analysis in Lower Saxony stated that the reference value for estimating the GMO content should be the total amount of pollen. Their opinion was that a reliable quantitative estimation of the GMO content of the pollen fraction was not possible at present.

The European Honey Market

The European Union is one of the biggest honey consuming markets in the world with 148,000 tons imported in 2010. Germany is the largest market within the EU with consumption at 100,000 tons per annum of which 80% is imported from EU Member States or from Third countries. As a result of the recent ECJ ruling the honey market in the European Union has suffered legal uncertainty which has affected beekeepers, honey packers, supermarkets and food producing industries which use honey as an ingredient in their products. The legal uncertainty and lack of confidence in analysis methods has caused a reduction in business and a fall off in trading especially in Germany as exporters and producers are forced to run expensive and time consuming analyses before they can deliver to their customers. As a result the honey supply from the EU Member States and Third countries has been reduced.

Already the authorities are testing honey imports, honey stored in warehouses of honey packers and the shelves of supermarkets. Some honeys packed even before the ECJ ruling had to be removed from the markets with high costs for the honey marketing companies. Supermarkets have made pro-active withdrawals of Canadian honey which is known to have GM canola pollen present. Food companies are already reducing or stopping the use of honey in order to protect their own products if they cannot get GMO free honey. Authorities in Member States are acting differently and this causes further uncertainty.

Within the EU Spain, Slovakia, Romania, Portugal, Poland and the Czech Republic are GM growing countries. Spain accounts for 90% of GM maize grown in the EU and are likely to encounter difficulties with honey exports to Germany as this variety is not yet authorised for human consumption.

International Honey Markets

Wherever honey is produced and GM crops are grown there is the potential for GM pollen in honey. Argentina is one of the largest honey exporters to the EU and it also has extensive cultivation of GM crops. China, Mexico, Brazil have a similar situation. The worst case scenario is that countries where unauthorised GM crops are grown will be unable to export honey to the EU where consumers seem to be demanding GM free products. The regulation of GM crop growing and the location of apiaries are not controlled to the same extent as within the EU. This creates a huge dilemma as it is those beekeepers from small cooperatives which are in need of trade outlets that stand to lose the most in this changing market situation.

It is likely that the price of honey in the EU will increase. The price of honey from GM growing countries will decrease and the price of honey from non-GM countries will increase. Countries such as Argentina and China may be unable to sell to the EU and their honey will drop in value and will likely find alternative markets in countries which will import GM produce such as the USA. Within the EU consumers are likely to have to pay more for their non-GM imports. There is also a possibility that substitutes for honey may be used by other food producers so as to circumvent the loss of GM free honey imports to the EU.

The difficulties faced by the small honey producer from Latin America and Africa are a cause for concern. They have widespread GM plantations and so their honey will not be acceptable in the EU market. They cannot see what the problem is as there is no scientific proof that traces of GM pollen in honey are a health risk to the consumer. Neither can they understand this general lack of acceptance towards GM products among EU consumers. Beekeepers in those countries will feel unfairly treated by having their honey refused or forced to accept lower prices.

Working Group Reports

There were around 200 delegates at the conference who were divided into groups to discuss issues arising from the ECJ ruling.

Group 1 discussed the problems arising from attempts at coexistence measures. The concern was that the distances that bees will forage and the risks from 'pollen flow' in the environment will require a wide safety margin in setting distances of apiaries from areas of GM growing which may need to be as much as 10 km. This was felt necessary as consumer demand within the EU was for GM-free products. They felt that the costs of honey analysis and loss of value should not be a responsibility carried by beekeepers. The possibility of migratory beekeeping activities further complicated matters. Some considered that coexistence methods were basically unworkable but others denied this. As a result many were of the opinion that the only way forward was for a regional separation of GM and non-GM crops. Other solutions discussed were for the analysis costs to be taken over and for research institutions or companies involved to buy over the honey.

Group 2 discussed detection methods for GM pollen in honey. Their recommendations were for a harmonisation of existing national standards and a validation of methodologies. International laboratories had to cooperate more and more clarity was required from the EC. They noted the basic problem of contamination by other plant materials in the stages of pollen isolation from the honey matrix.

Group 3 discussed the consequences of the ECJ judgement. Their views were the most vociferous. There were great concerns among producers in the EU and Third countries and from exporters and the international trading and packing industry. Already contracts had been cancelled and analyses were being demanded. The lack of clearly established methodologies for testing caused great uncertainty. They also noted that even if there is authorisation of current GMOs there are huge future problems as there are so many more GM plants being developed which are not authorised for human consumption or not intended as such. Each one could be a problem for honey. They also felt that many consumers had not had a chance to take part in any rational discussions on GMO safety and that further public education was required.

Review and Future Considerations

GMO cultivation throughout the world will continue to grow. There is a long list of GM plants being developed which are not necessarily authorised for use as food so the risk of GM pollen contamination will continue to cause problems as long as the present legal situation holds. The list is complex and the risks will be assessed before and during experimental releases but we should be aware that there are many innovative developments that could be very important for human health

in the future. For example a number of important vaccines, biosynthetic insulin and anti-cancer antibodies are being developed using what is known as 'Pharming' genetics. This is genetic engineering to insert genes that code for useful pharmaceuticals into host animals or plants. In this way the pharmaceutical product may be made in large quantities at a much reduced cost compared with conventional methods.

Safety evaluation is according to laws that apply to all Member States and ensures that a GM food can only be allowed onto the market if it can be documented by scientific evidence that it is as safe and healthy as a comparable conventional product. The European Food Safety Authority (EFSA) has an expert panel that oversees this and there is an additional 'standalone' panel that makes an Environmental Risk Assessment. Under present legislation it is the GMO applicant body which has the responsibility to provide the full data to demonstrate the safety of a GM product. To date the EFSA panel have issued favourable opinions. Some may look askance at this but the EFSA have asked for more data in 95% of applications and only a few of these have been withdrawn.

The issue of 'Consumer Opinion' and a demand for GMO-free products was mentioned often at the conference. Whilst this is something enshrined in our democratic society we must ask, 'do individual consumers always understand what they are signing up to?' Freedom of choice belongs not only to the consumer but also to the farmer, beekeeper and the many responsible scientists who struggle to evaluate and develop new crops to feed the world. We have good safety assessment systems in place so that public education and transparency will no doubt help to move opinion. What of the rights of small producers from Third countries? Are they to be denied markets in the EU? I found an interesting website where American consumers were desperately trying to locate 'raw honey'. It seems they have a problem with honey that has all the pollen grains filtered out by commercial processes and they want it put back in despite the GM pollen that will be there. This is just one instance where 'Consumer Opinion' is the exact opposite from that in the European Union. It could be argued that we have a right to our beliefs and perhaps the issue of GMO foods lies partly in this domain.

Finally, though coexistence measures may work in Germany (where every hive is supposedly registered) if there are decent separation distances, we cannot be sure of this in Scotland if more extensive GMO releases were to take place. Our bee inspectors and the Scottish Government have done much with disease inspection services and the extension of 'BeeBase' but we are a long way from registration of all beekeepers. It would require development of a complex system to keep track of GM, conventional and organic growers, differing topography, weather patterns, attractive wild flowers and the movement of hives to create a workable coexistence. For the time being we have a voluntary system of hive registration and neither the SBA nor the authorities know where all the hives are. This will restrict us in the SBA when it comes to discussing future policy options.

The EFSA have now said that there are no human health concerns over MON 810 maize and have asked Monsanto to formally apply for food authorisation. I was told that within a few months a solution would be found but others stated that legal processes are so slow that it will take 2 years or more to resolve the problem. In the meantime we have to deal with it as best we can.

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