Thematic workshop October 8th 2014 at Julius Kühn - Institute in Berlin Germany

Future challenges for IPM in a changing agriculture

A group of 45 researchers, policy makers, government officials and agricultural advisors met in Berlin for a day of strategic discussion on future IPM.

The overall objective of this workshop was to identify and address long term needs and strategies for national and transnational IPM research programmes, and ensure the emergence of cutting edge far-sighted and innovative approaches.

Plenary talks opened the workshop where four speakers discussed the impact of policy, retailers, consumers and climate change on IPM. The talks formed the basis of the afternoon discussions in four groups on the following subjects: policy impact on IPM, impact of climatic changes on IPM, impact of retailers/consumers on IPM and finally, the role of research and knowledge transfer to advisors and farmers in the adoption of IPM. The discussions were organised as a World Café, where all groups were given the opportunity to discuss all four topics in turn. A moderator and minute taker were designated to each discussion subject and the speaker on the subject remained in the relevant discussion group for all four groups. The main outcomes and conclusions from the discussions were presented in the closing session.

The first talk, "Pesticides, legislation and the availability of pesticides", was given by Johan Edens, Netherlands Food and Consumer Product Safety Authority (NVWA).

Summary: Regulation on placing plant protection products on the market (Reg. 1107/2009/EU), Regulation on maximum residue levels (MRL's) (Reg. 396/2005/EC) and the Directive on sustainable use pesticides (Dir. 2009/128/EC) all have influence on the availability of pesticides. Since the EU review programme in 2003 – 2010 73% of the pesticides have been banned. The regulation of plant production products has led to restrictions and withdrawal of pesticides. A recent example is the temporary banning of some neonicotinoids due to effects on bee survival and behaviour. It is expected that the increased awareness of products with endocrine disruption effects will also result in the withdrawal of currently used pesticides. The regulation on maximum residue levels will lead to a revision of the risk evaluation procedure. The sustainable use directive leads to alteration in pesticide use in specific areas, e.g. banning of pesticide use on public areas. These legislative initiatives add to the development with decreasing number of pesticides for agriculture to choose from. New issues arise, *e.g.* the exposure of residential neighbours to farmland, which has lead EFSA to work on an evaluation method that could potentially lead to new restriction in the future. Legislation, however, also has positive effects, *e.g.* the decision to have a fast track approval procedure for low risk pesticides in the future, the zonal evaluation rather than national evaluation and easier access to mutual recognition.

The second talk, "EU CAP reform 2014 – 2020: Greening", was given by Kim Martin Hjort Lind, Dept. of Food and Resource Economics, Copenhagen University

Summary: The CAP history was briefly summarised to illustrate the changes initiated with the recent reform of the CAP. The economic, environmental and territorial challenges were described.

Economic: food security, globalization, low productivity growth, price volatility, high input costs.
Leading to a policy objective of viable food production by enhanced competitiveness

Environmental: resource efficiency, soil and water quality, threats to habitats, biodiversity.
Leading to a policy objective of sustainable management of natural resources and climate action by improved sustainability

Territorial: declining and aging populations in rural areas, declining economic activity and social services in rural areas.
Leading to a policy objective of balanced territorial development by greater effectiveness

After the CAP reform there are two possibilities to pursue greening: the cross compliance for direct payment in Pillar 1 and the agri-environmental measures in Pillar 2. The greening component of Pillar 1 constitutes around 30% of the direct payment with a mandatory crop diversification, maintenance of permanent grassland and ecological focus areas. Six common priorities have been introduced for the rural development policies of pillar two:

- Fostering knowledge transfer and innovation in agriculture, forestry and rural areas
- Enhancing farm viability and competitiveness of all types of agriculture in all regions and promoting innovative farm technologies and sustainable management of forests.
- Promoting food chain organisation, including processing and marketing of agricultural products, animal welfare and risk management in agriculture
- Restoring, preserving and enhancing ecosystems related to agriculture and forestry
- Promoting resource efficiency and supporting the shift towards a low carbon and climate resilient economy in agriculture, food and forestry sectors
- Promoting social inclusion, poverty reduction and economic development in rural areas

Implementation of the new CAP awaits Member States deciding on which policies and measures to use as well as assessing the amount of area eligible for the various options. Although the CAP contains several greening measures there is no reference to IPM.

The third talk, "Will the preferences of consumers affect the IPM implementation?", was by Wim Rodenburg from the Dutch Produce Association.

Summary: The consumers are highly influenced by headlines in the news and the interactions on social media, which leads to high focus on certain issues related to agricultural production for short periods of time. The behaviour of the consumers, however, does not reflect the public display of dissatisfaction with environmental effects from agricultural production. In practice, the consumers choose by price, taste and unspecified "quality", rather than by certified products as organic or sustainable production or transport (see slide 7). According to a questionnaire from Nestlé, Germany in 2012, the consumers were willing to pay extra for animal welfare (34% of the respondents) and no child labour (32% of the respondents), whereas less than 10% of the respondents were willing to pay extra for sustainable energy in production, green transport and low energy in production (see slide 8).

There are some emerging trends among consumers who are becoming more interested in 'the farmer behind the products', having their own production (vegetable garden, mini-plants) and the nutritious value of the products ("vegetables are my pharmacy").

Some retailers are trying to force their suppliers into more environmental sound production by attaching demands to the purchasing of products. The main focus is on chemicals, but other issues can be of relevance for putting in demands for the production.

The difficulty of labelling IPM produce is the definition of IPM, as this span from close to traditional conventional farming to a concept close to organic farming. The important fact that IPM per definition includes a more sustainable pesticide use is hard to communicate to consumers. Even organic farming is not defined the same way in all European countries. So how can IPM be promoted among consumers? IPM is more than the amount of chemicals used, so it can be a marketing solution to address certain market problems (sustainability, water usage, new breeding techniques etc.), be used by marketing specialists to cope with retail demands, and might be the step towards "controlled" organic production.

The fourth talk on the topic "Global climate change and spread of native and invasive pests: will they promote IPM adoption?" was given by Giuseppe Stancanelli from the Animal and Plant Health Unit, European Food Safety Authority, Parma, Italy.

Summary: Climate change scenarios foresee a change in temperatures for most of Europe towards a warmer environment . This will in turn affect many crop pests. It has already been observed for potato late blight that occurs sooner after planting today than twenty years ago. The alteration of CO_2 levels can lead to a variety of changes in plant physiology and in turn in plant communities as a consequence of many underlying changes in soil biota ecosystems and endophytic activity. Climate changes can increase the number of invasive species worldwide as shifts in temperature regimes and increased incidents of extreme weather events will create new favourable habitats for many species. Furthermore, the increased transport of goods around the world increases the likelihood of introducing new species in areas remote from the production area. This will demand introduction of new management practices to cope with the new species in agriculture.

In order to manage the changes introduced by climate changes a shift in the agricultural and climatic research is required. Climate changes are not presently seen as a major obstacle to IPM implementation. But climate change is seen as a threat for agricultural production in many countries in the tropical zones. In the recent years IPM research has recognised the importance of climate changes and the number of publications with climate changes as a part of the rationale for IPM implementation has increased. The opposite; IPM being an important issue in climate change research, has not manifested itself yet. Global change and invasive alien species should promote IPM research and development. IPM is a key risk mitigation option to limit agriculture and forestry impact of a new invasive species once it has introduced and spread. There is a need for preparedness to new plant pests invasions, a need for risk assessment to provide predictions and early warning and a need of integration between pest risk assessment and IPM research.

Summary of discussions

Discussion of policy impact on IPM implementation

Moderator and minute taker: Johan Edens and Mette Sønderskov

There was a general agreement that the decreasing amount of available pesticides will continue in the near future as a consequence of the EU pesticide policy. There were differing expectations to reductions in pesticide availability, ranging from 10 to 40% of the current number. This increases the demand for alternative solutions. Hence, the market for IPM methods will increase. The speed of withdrawal of pesticides has to take into account the pace of IPM development. If pesticides are removed from the marked faster than guidelines for IPM is developed the farmers will face major problems. One reaction to banning a widely used pesticide is to continue to use chemical solution, but use other products of which some will have to be applied in a very high dose to be as efficient as the banned pesticide. This is counteractive to IPM and has to be taken into account before removing widely used pesticides. It is important for both the public and policy makers to keep in mind that the purpose of IPM is not to exclude pesticides totally, but to decrease the dependence on chemical solutions and keep the use to a minimum. In the discussion it was suggested to increase the availability of some pesticides by authorising them for use as part of IPM strategy. This, however, will be extremely difficult to enforce because the use of pesticides is difficult to monitor. This also led to a discussion on the differences among EU member states in pesticide availability. The farmers are highly aware of the fact that some pesticides are legally sold in the neighbouring countries although not in their own countries. This decreases the confidence in the authorities and illegal markets for pesticides across borders are known in many countries.

It was also discussed how to better use the label information as IPM leverage. Some suggestions were to force industry to implement IPM in the description of intended uses; Good agricultural practices (GAP), thus putting the information of possible IPM measures on the label. Another suggestion related to the label was to limit the maximum number of applications for additional fungicides and insecticides..

A continuous decrease in pesticide availability will probably increase the interest in new technologies like cis-genetic plant varieties, RNA-interference etc. An increased interest in biological control is likely, but the development is limited by the size of the market for specific biological agents. In weed management technologies efficient mechanical control are available and highly relevant for IPM implementation. To promote the development of new technologies and biological control agents a procedure for a fast track approval of low risk measures is needed. The implementation of such measures should be encouraged through temporary subsidies for using non-chemical methods.

It was discussed whether CAP-subsidies can promote IPM implementation. Implementation of IPM is not directly a part of the new CAP, there are, however, initiatives in the CAP, which can encourage the implementation of some IPM measures and lead the development of agriculture in a more sustainable direction. An important part of the reformed CAP is the requirement for crop diversification, as a diverse crop sequence is an important part of IPM. When farmers are required to have at least 3 different crops, it might spur the interest in minor crops. This, however, might represent a problem for the farmers because of lacking market opportunities. It will be important to encourage the building of the whole market chain for minor crops, if highly diverse crop rotations should develop including a variety of minor crops. The incentive could be a kind of temporary subsidy for the market chain until the processes are up and running

and the market mechanisms of supply-demand are in place. It is important that the marked chain is available before the farmers start to grow new minor crops.

A suggestion from Italy was to put certain low risk pesticides on a green list. Only farmers, who only use green list pesticides, can get a CAP subsidy.

The increased focus on greening and the possibility of including agro-environmental measures in the rural development funding might act as leverage for public awareness of the environmental actions of the farmers. There is often negative coverage of agriculture in the media. A greater focus on the environmental friendly actions will benefit the image of the whole sector. Agri-environmental measures are payment to farmers who subscribe voluntarily to environmental commitment in terms of environmental farming that goes beyond legal obligations. The question is whether IPM implementation is mandatory or voluntary for the farmers.

From the UK there was an expectance that some farmers, who has not been able to gain subsidies from the EU before the CAP reform, will be able to by the new initiatives.

Discussion of climate change influence on IPM

Moderator and minute taker: Sylvia Bluemel and Jay Ram Lamichhane

To start the discussion, a question was put forward by the moderator: “Will climate changes (CC) impede or promote IPM?” Generally it was considered difficult to decide conclusively whether CC will promote or impede IPM as other drivers affecting IPM cannot be separated from CC. Approximately, 25% of the participants argued that CC does not have any impact on IPM (the latter will develop anyway regardless of CC), 25% argued that CC will impede the implementation of IPM (invasive pests, the need of rapid solutions) and 50% argued that CC will help the development and implementation of IPM. Most participants did agree that CC will encourage the development of early warning systems for forecasting and pest monitoring and promote research to create knowledge for better understanding the biology and epidemiology of pests and their natural antagonists

It is important to distinguish the role of global change from that of CC. While increased global trade can promote the introduction of invasive pests into a given region, climate change affects their potential establishment and impact. Hence, the most critical situations are created when global change is coupled with CC but their individual effects are considered less drastic. In the discussion on whether CC will promote or impede IPM implementation, two scenarios need to be distinguished: a) New invasive pests such as phytosanitary species for which eradication or containment measures are needed. Here chemical solutions are often used to solve the problem in the immediate situation b) Indigenous and re-emerging pests, which increase as a consequence of CC, for which a combination of control tools at different levels are often sought comprising several years of experiences on certain pest-crop combinations. Hence with regard to mid-term and long term effects CC will probably promote the implementation of IPM.

In order to evaluate the effects of CC on IPM it is important to consider the fact that IPM is a tool box. Within the context of climate change it is central to determine which tool will be the most/least influenced by climate change. Based on this information, more focus is needed on the development and implementation of suitable tools. For example, plant resistance to pests is a pre-requisite for IPM, but breeding for plant resistance to pests takes a long time while chemical pest control is often immediately available and therefore farmers are prone towards the use of pesticides. CC will probably promote the development of new tolerant crop varieties adaptable to the changes and consequently promote this aspect of IPM. Additionally more new crop protection tools than those available for the moment are needed. The development and implementation of such new tools to protect from extreme weather conditions such as heavy rainfalls might be encouraged by CC, such as netting of orchards.

Another aspect is that CC and extreme weather events will increase the motivation to network at regional/national and international level.

Discussion of the role of research and knowledge transfer for advisors and farmers in the adoption of IPM.

Moderator and minute taker: Antoine Messean and Claudia Wendt

One of the major conclusions among the participants were that instead of a narrow focus on specific crop-pest relationships, IPM implementation will benefit from a more broad system approach in research. For many crops we already have substantial knowledge of the individual crop-pest relationships, but lack the overall research to combine them into system guidelines.

Many participants had the opinion that there is a lack of proper knowledge transfer between research and practical management. It was stated that broadening the scope and putting IPM in resilient and sustainable systems would be beneficial. The research should be driven by practical questions, not the other way around; research driven questions to initiate more research. One point was that in the implementation of IPM it is important to take into account the full picture of the production chain; from the producer to the consumers. If the knowledge transfer focussed on the whole production chain the farmers would have a better basis for the implementation of IPM. For the farmer to gain knowledge about IPM it is important to ensure that interested farmers are able to access the available knowledge. In some countries this is not presently the case and the gap between research and practical management is large. A valuable tool in the knowledge transfer is demonstration farms. The practical approach of demonstration farms is an important way of reaching over the gap and the advisory services have an important role in this process. If the knowledge transfer is not addressed properly the implementation of IPM will become very slow and difficult. Therefore, dissemination has to be integrated in research projects on IPM. Increased funding for this is needed. It is also important to incorporate IPM knowledge in the education system.

The economical aspect of IPM implementation is poorly addressed, but crucial to the farmer. If IPM is not cost-effective the farmer is not able to implement IPM as the farmer depends on a high productivity and surplus in the balance sheet. There is a tendency for the short term consequences of the farmer's choice to be decisive for the decisions in practical management, but more focus on the long term consequences, e.g. of resistance development, might benefit IPM solutions. A better communication of the benefits of IPM is needed for more farmers to implement a high level of IPM. For some IPM solutions it might be necessary with financial support in the early phases. IPM should demonstrate that it is efficient/economical profitable and environment-friendly

It was not clear to the participants how much added value of sharing experiences/results at the EU we can gain. For this to increase IPM implementation we need to work closer together across borders and between regions.

Role of retailers, consumers and other customers of agricultural products in the adoption of IPM.

Moderator and minute taker: Silke Dachbrodt-Saaydeh and Claus Bo Andreasen

It was noted by the majority of participants that the minimum residue level (MRL) requirements of some retail and supermarket chains, which basically concentrate on 3-5 major global players, are counterproductive to the IPM concept with regard to resistance management, use of selective pesticides, the use of treatment thresholds and environmental sustainability. The perceived risk by consumers, which is promoted by NGOs and the media, is a clear driving force to MRL settings below the legal thresholds. It is important for the agricultural business to engage in the public discussion with facts about IPM to ensure a broad and multidirectional discussion.

Information and education for all concerned groups are needed:

i) Farmers; ensure education and initial training on IPM methods and the value of implementing IPM
ii) General public, including children; information about food production methods, including IPM, and how difficult it can be to produce food, especially with regard to plant protection measures. Educate the general public on the consequences of what no crop protection would mean, as no farmer, neither conventional nor organic, will ever let the crop grow without any protection. Produce simple messages for consumers, which focus on regional rather than on integrated production. Social media could be used to communicate with the public; this will increase the contact to the young generation.

A suggestion was to develop a label or indicator for IPM and sustainable production. The problem is that there are many levels of IPM implementation. Therefore, the communication of IPM to the broad public becomes more complicated and difficult to get across to the consumers. In IPM pesticides still play an important role, but the aim is to limit the dependence on the chemical solutions. Even though organic is not the same in all EU countries, the common point is that no pesticides were used directly in the production and this point is easily communicated.

- Legislation, i.e. regulators should aim to mitigate those ever increasing requirements of the retail chains and engage in discussion with them.
- Science and research should make more use of demonstration fields and field days to create an understanding of the real risk (vs. the perceived risks of consumers) and make efforts to explain science in an easy-to-understand way.
- A simple indicator which informs on the societal, environmental and economic benefits could help to create an understanding.
- Communication needs to be increased on the environmental benefits of IPM, local/regional production to achieve/address the identification of consumers with the products. The messages to the general public should be clear, simple and focus on the benefits. The media must be better informed and educated to avoid a simplified good or bad vision of complex topics.
- In summary, an understanding along the food chain must be created to enable IPM methods to become widely implemented in practice and not be impeded by retail chain requirements. Growers should be empowered to produce according to IPM guidelines rather to respond to the industrialized requirements of the retail chain.