



ELEVENTH JOINT CIPAC/FAO/WHO OPEN MEETING

(58th CIPAC Meeting and 13th JMPS Meeting)

Hotel Crowne Plaza, Liège, Belgium

23 June 2014

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1. Opening and welcome

Dr Rajpal Yadav, WHO Pesticide Evaluation Scheme (WHOPES), Department of Control of Neglected Tropical Diseases, representing the World Health Organization (WHO), and Chairman of the Joint Open Meeting, welcomed all participants to the 11th Joint CIPAC/FAO/WHO Open Meeting. Special thanks were extended to the Walloon Agricultural Research Centre (CRA-W) and the Federal Agency for the Safety of the Food Chain (FASFC), Belgium for hosting the meeting.

Dr Yadav introduced Madam Yong Zhen Yang, representing the Food and Agriculture Organization of the United Nations (FAO), and Dr Ralf Hänel, Chairman of the Collaborative International Pesticides Analytical Council Ltd (CIPAC), to the meeting. The special guests from Belgium present at the opening of the meeting were:

Mr Jean-Pierre Destain, Director General, Walloon Agricultural Research Centre (CRA-W)

Mr Destain was honoured to welcome participants to Liège. CRA-W is a public interest organization of approximately 450 staff (1/3 being scientists) spread over three sites; 300 ha are used for experimental farms, laboratories and administrative buildings. The organization covers the main fields of interest in agriculture, food processing and environmental science. Teams covering biotechnology, plant production, crop protection, general agriculture and product quality all work together in coordination. CRA-W collaborates with many other companies and organizations both in Belgium and globally. CRA-W has considerable analytical capability: it can determine 300 different analyses on a wide range of materials covering plant protection products, environmental protection and animal physiology; focus is on the quality of agricultural products and food safety, pesticide residues and mycotoxins.

The European Union Common Agricultural Policy poses many challenges. CRA-W supports the development of intensive agriculture to be productive while remaining sustainable and environmentally friendly, in order to maximize natural resources, enhance the value of products and avoid waste. This model should be adhered to because it can benefit both conventional and organic farming. CRA-W has developed a scientific programme based on three principles:

- a. Dynamic management of factors in production; for example exploring resistance to disease, and ways to minimize the use of plant protection products in a sustainable way.
- b. Risk management and other attitudes to change; such as climate change and socioeconomic change, as well as their management.
- c. Management and harmonization of production; for example the development of methods for the characterization of agri-food products to help optimize their production and quality.

Plant protection products play an important role in both sustainable and organic farming. Protection of the food supply is important to ensure the good health and welfare of people worldwide. FAO and WHO have done invaluable work in developing specifications and guidelines for plant protection and public health pesticides, and CIPAC has developed and standardized methods of analysis. This work is essential for the sound management and safe use of plant protection products, thus reducing the risk for human health and the environment.

CRA-W is a WHO collaborator in the quality control of pesticides and is internationally renowned in this area. It is proud of its contribution to the work of CIPAC, FAO and WHO. Mr Destain thanked Dr Olivier Pigeon and his team for their efforts in organizing this year's meeting and in conducting the official work in support of WHO, FAO and CIPAC. He wished all participants a successful meeting and a pleasant stay in Liège.

Mr Walter Van Ormelingen, Director, Federal Agency for the Safety of the Food Chain (FASFC)

Mr Ormelingen welcomed participants to Liège. FASFC was pleased to be able to support the meetings this year. FASFC is the Competent Authority for Official Control of the Food Chain, including animal and plant health, and export certificates for all products in the food chain. A relatively young institution (14 years old), it employs approximately 250 staff and works in collaboration with 500 control inspectors and 600 veterinarians.

The main focus of FASFC is controls and inspections: in 2013 the agency conducted 200 visits, 185 inspections and analysed 1700 samples. It is the Competent Authority for the inspection of agricultural pesticides in the supply chain for marketing and use of pesticide products, residue levels of pesticides in foods and the quality of pesticides. Also in 2013 FASFC analysed 3600 samples of food and feedstuff for pesticide residues as well as 75 plant protection products for compliance with specifications. The agency has its own laboratory based in Liège. The important work of FASFC in enforcing and controlling plant protection products in Belgium would be explained further at the CIAPC symposium on 24 June. Mr Ormelingen wished all participants fruitful discussions and a successful stay in Liège.

Dr Hänel (CIPAC) welcomed participants on behalf of CIPAC. Although Belgium is not a large country in area it plays a significant role in the analysis of pesticide products. For the fourth time in its history CIPAC has held a meeting in Belgium. Belgian CIPAC members have been actively involved in the development and growth of its work for many years; in particular, previous CIPAC members Jean Henriet and Michael Galoux. CIPAC would not be the organization it is today without their hard work. Dr Hänel also thanked the current CIPAC member Olivier Pigeon and all his team at CRA-W for organizing the meetings.

Madam Yang (FAO) welcomed participants on behalf of FAO and thanked the hosts and organizers for their hard work and effort in organizing the meetings. The JMPS meeting was highly successful. Madam Yang also thanked Belgium for its support to FAO in pesticide management, noting in particular that CRA-W works closely with FAO to achieve the safe disposal of obsolete pesticides in developing countries.

FAO/WHO specifications and CIPAC methods play an important role in the quality control of pesticides and are linked to sound pesticide management ensuring food safety and security. FAO is implementing five new strategic objectives:

- 1) To help eliminate hunger, food insecurity and malnutrition
- 2) To make agriculture, forestry and fisheries more productive and sustainable
- 3) To reduce rural poverty
- 4) To enable inclusive and efficient agricultural and food systems at national and global levels
- 5) To increase the resilience of livelihoods to threats and crises.

Quality control of pesticides is important to these strategies by ensuring good-quality pesticides for use in agricultural production and reducing pesticide risk to food safety and the environment. FAO assists member countries in implementation of international quality standards and continues to support the activities of JMPS and CIPAC. Madam Yang thanked national authorities and industry for their collaboration and contribution to this work. She wished participants a successful meeting.

Dr Yadav (WHO) welcomed participants to the meeting. He recalled that WHO is at the forefront of pesticide management activities in public health. Pesticides are essential for food security, but if they are not used safely or judiciously there are consequences to the health sector. Collaboration between FAO and WHO as well as quality control of pesticides are therefore important. Quality control is part of the life-cycle of pesticide management and WHO strongly supports sound pesticide management. FAO and WHO have been collaborating to develop policies for pesticide management as part of vector control, publish joint guidelines and support Member countries.

Specification-setting and methods of analysis to measure the quality of pesticides are highly relevant to the work of WHO. Dr Yadav thanked all those involved for their contribution to this invaluable work. WHO and CRA-W have had a long collaboration and WHO is grateful for their support to undertake quality control testing for public health pesticides. He also thanked Dr Olivier Pigeon and the teams at CRA-W and FASFC for their excellent organization of the meetings.

Finally Dr Yadav thanked everyone for attending the meeting and declared the 11th joint FAO/WHO/CIPAC meeting officially open.

2. Arrangements for chairmanship and appointment of rapporteurs

Dr Yadav noted that the Chairmanship of the Open Meeting rotates between the three organizations (FAO, WHO and CIPAC). This year it was the turn of WHO to facilitate the meeting, with himself as Chair.

Dr Yadav proposed two rapporteurs for the meeting: Mrs Sonia Tessier (CIPAC and FAO) and Dr Finbar Brown (WHO), who were duly appointed. The rapporteurs were thanked for their support.

3. Adoption of the agenda

No changes were made to the agenda and it was adopted.

4. Summary record of the previous meeting

Tenth Joint CIPAC/FAO/WHO Open Meeting; 57th CIPAC Meeting; and 12th JMPs Open Meeting, Ukraine

The summary record of the previous open meeting held at the Hotel 'Rus', Kiev, Ukraine on 10 June 2013 is available on the FAO/WHO website.

There being no comments, the minutes of the 10th CIPAC/FAO/WHO Open Meeting (2013) were accepted.

5. Summary of actions taken after the 57th CIPAC and 12th JMPs meetings

5.1 CIPAC

Dr Ralf Hänel, Chairman of CIPAC, informed the meeting of the major activities carried out by CIPAC since the previous Joint Open Meeting:

No new formal CIPAC publications were published in 2013; however activities continue and CIPAC is working towards the publication of the next handbook.

Questions/comments: There were no questions or comments.

5.2 FAO

Madam Yong Zhen Yang informed the meeting of the activities, meetings and events held by FAO since the 10th Joint Open Meeting held in Kiev:

Training workshops and meetings

- FAO/WHO Joint Meeting on pesticide residues, September 2013, Geneva, Switzerland
- FAO/WHO Joint Meeting on Pesticide Management, October 2013, Geneva, Switzerland
 - key issue: Code of Conduct revision

- Africa regional training workshop on MRLs and residue risk assessment of pesticide residues in Ghana (Accra), February 2014
- 46th CCPR, May 2014, Nanjing, China, > 300 MRLs approved
- Latin America regional training workshop on residue data generation for MRLs and residue risk assessment in Costa Rica (San Jose), June 2014.

Publications

- 2013 JMPR report and evaluations (residue monographs)
- New Code of Conduct on Pesticide Management approved by the FAO Conference (June 2013)
 - Joint FAO/WHO publication of the new Code of Conduct approved by WHO (January 2014)
 - Adoption by UNEP (under processing)
 - New Code of Conduct translated into Arabic, Chinese, French and Russian; Spanish (pending)
- Guidelines for Official Quality Control of Pesticides in Contracted Laboratories published (trial edition)

Pesticide registration toolkit

- FAO is preparing a Pesticide Registration Toolkit as a support system for decision-making on pesticides by registrars in developing countries:
 - to assist registrars in the evaluation and authorization of pesticides;
 - as a web-based registration handbook intended for daily day use by pesticide registrars;
 - as a non-automated system for the evaluation of pesticides;
 - to support and facilitate informed decision-making by registrars, but not to take decisions for registrars.
- Development is expected to take about 2 years.
- The toolkit will be made available through the FAO web site (by 2015).
- Extensive training will follow on use of the toolkit for registration authorities in developing countries.

Technical projects

GCP/RER/040/EC. “Improving capacities to eliminate and prevent recurrence of obsolete pesticides as a model for tackling unused hazardous chemicals in the former Soviet Union”

Two main outcomes:

- The first targets obsolete pesticides
- The second concerns the legal situation regarding pesticide registration and management, pesticide life-cycle management, alternatives to highly hazardous pesticides and increases in sustainability in agriculture.

Other outcomes:

- Most of the countries express an urgent need to strengthen official quality control of pesticides by supporting the existing laboratories but also to make better use of FAO specifications in registration of pesticides.
- Reference to FAO specifications and the processes for quality standards and equivalence as set out in the Manual are often hampered by language barriers.

- A Russian version of the FAO/WHO manual would greatly facilitate the use of these procedures.

Questions/Comments: There were no questions or comments.

5.2 WHO

Dr Rajpal Yadav informed the meeting of the major activities carried out by WHO within the framework of sound management of public health pesticides since the previous Joint Open Meeting:

International Code of Conduct on Pesticide Management

- The International Code of Conduct on Pesticide Management (the Code) was adopted in January 2014 by the Executive Board of WHO. The Code was approved by the FAO Conference in 2013 and was developed with support from the FAO/WHO Joint Meeting on Pesticide Management.

Objectives of the Code

- Designed for use within national legislation
- Describes shared responsibility of many sectors
- Addresses the need for a cooperative effort
- Recognizes the need for capacity strengthening for its implementation
- Describes the standards of conduct for pesticide management
- Complements legally binding instruments on chemicals management

The Code will

- Support the continuing joint efforts of WHO and FAO in building capacity of their Member States for the sound management of pesticides
- Contribute to implementing relevant WHO policy
 - WHA63.26 on *Improvement of health through sound management of obsolete pesticides and other obsolete chemicals*
 - WHA50.13 to support research on integrated approaches to the control of vector-borne diseases

Sound management of pesticides

- Completion of a 6-year project on reducing health risks (2007–2013)
- 7th FAO/WHO Joint Meeting on Pesticide Management (Geneva, 14–18 October 2013)
- Guidelines
 - A generic risk assessment model for disinfection of aircraft with chemical insecticides
 - Guidelines on certification of pest control operators (in progress)
 - Guidelines for personal protection when working with public health pesticides in tropical climates (in progress)
 - Guidelines for efficacy testing of molluscicides (in progress)
- Country support
 - **African Region:** Training course for indoor residual spraying (IRS) [Benin, April 2014];

- **Americas Region:** Designation of the US Navy Entomology Center of Excellence (NECE) as a WHO collaborating centre for testing insecticide application equipment;
- **Eastern Mediterranean Region:** Development of a national policy for integrated vector management (IVM) [Sudan, December 2013] and a pesticide management workshop [Islamic Republic of Iran, November 2013];
- **South-East Asia:** Designation of a pesticide quality control testing laboratory of the Department of Medical Sciences, Thailand as a WHO collaborating centre.

WHO study of long-lasting insecticidal net (LLIN) fabric strength determination

- WHO is conducting a study to determine the fabric strength parameters of long-lasting insecticidal nets. The tests include bursting strength, wounded bursting strength, denier, tensile strength, tearing strength, flammability and mass of netting fabric (GSM). A WHO Consultation is proposed in August 2014; the outcomes will inform LLIN specifications and procurement decisions (value for money) for long-lasting insecticidal nets.

Evaluation of public health pesticides

- The WHOPES global network has significantly expanded in the past 5 years. Currently 14 pesticide products are undergoing WHOPES testing for vector control.

New paradigms in vector control

- WHO established an advisory body in 2013, the Vector Control Advisory Group (VCAG), to address new forms of vector control/paradigms.
- VCAG was set up in collaboration with the Bill & Melinda Gates Foundation.

Questions/Comments: There were no questions or comments.

6. Technical liaison with other organizations

Dr Yadav noted that WHO, FAO and CIPAC work with many regional and international organizations. He called on some of these organizations to present reports of their work on the management and quality control of pesticides.

6.1 AgroCare

Mr Garth Drury, representing AgroCare, informed the meeting that AgroCare is a global organization representing generic pesticide manufacturers comprising 865 different companies and four regional associations: AgroCare Latin America (previously ALINA, Latin American Association of the National Agrochemical Industry); ECCA (European Crop Care Association); PMFAI (Pesticides Manufacturers and Formulators Association of India); and CCPIA (China Crop Protection Industry Association). All AgroCare Member Associations have expressed their support for the International Code of Conduct on the Distribution and Use of Pesticides. AgroCare supports science-based regulations and a balance in intellectual property rights that ensure fair market access of competitive post-patent products.

Mr Drury referred to AgroCare's various global and regional initiatives, including:

- Active participation in the definition of key guidelines for implementation of the Code of Conduct through participation in the JMPM and ad hoc workshops.
- Workshops and public forums on registrations and the determination of equivalence

- Ad hoc meetings and workshops on registrations, training manuals, QA/QC, user surveys, educational programmes and best practices.
- Participation as an observer in JMPM at its most recent meeting (Geneva) and conference call (June 2014).

ECCA

- Participated in discussions on risk-based analysis of pesticides with regulators, academia, NGOs and intra-industry groups.
- Actively communicates the risks and costs of counterfeiting in specialist press and at conferences in Europe:
 - estimated to be 15% of the global market
 - Europol estimated *that more than 25% of products in some EU Member States* are counterfeit (Agrow, 17 January 2012).
 - routine sampling of commercial products may uncover counterfeit products (1–4 in 10 products sampled) as well as ‘real’ products.

ALINA

- Renamed AgroCare Latin America and moved its offices from USA to Costa Rica.
- Opposes the importation of pesticides without registration in their countries of use (e.g. Colombia, Ecuador, Peru).
- Supports packaging return schemes (e.g. Paraguay).
 - important to prevent refills with counterfeit material.

PMFAI

- Raised objections against allowing imported formulations without registering of technical grade pesticide in India, as this provision encourages import of sub-standard pesticides to the country.
- Provides continuous training programmes for farmers regarding use, protection equipment and environmental issues.
- Efforts ongoing to educate the public and the media on scientific issues regarding crop protection products.
- Safe Disposal of Used Pesticide Containers; PMFAI is an invited participant in the committee constituted by the Ministry of Agriculture of the Government of India to recommend measures for safe disposal of pesticide containers.

CCPIA

- The Glyphosate Task Force has been very active in environmental control.
- CCPIA and EP Ministry drafted jointly two emission standards of pesticide industry:
 - “*Air Pollutant Release Standard of Pesticide Industry*”
 - “*Water Pollutant Discharge Standard of Pesticide Industry*”
- Proactive in responding to termination of Paraquat SL formulation
 - *Paraquat formulation in water base will be banned to produce in July 2014*
 - *CCPIA provides coordination in R&D for replacement and new formulation types*
- Advocates “responsible care” to promote HSE (Health, Safety and Environment)
- Set up a committee on safe use of pesticides to emphasize stewardship
- Formed a pesticide adjuvant committee to monitor adjuvant risk and quality improvement (June 2013)
- Formed a pesticide package committee aimed at standardization of packaging and automation of repackaging production (November 2013)

- Facilitated international technology exchange and trade cooperation by forum and exhibition:
 - AgroChemEx – Eastern Europe's agrochemical international forum and agrochemical products exhibition (Kyiv, Ukraine, July 2013)
 - Myanmar's international agricultural fair and Asian agrochemical peak forum (Rangoon, November 2013)

Questions/Comments: None.

6.2 ASTM International

ASTM International (American Society for Testing & Materials) is one of the world's largest organizations for developing standards, established in 1898. The ATSM is an internationally recognized not-for-profit organization, funded mainly through income from sales of its published standards, specifications, test methods and books. The headquarters is in Philadelphia, USA. Dr Alan Viets presented an update of ATSM International's current work on "biorationals" (i.e. "bio pesticides", "biological pesticides" or "organic" pesticides).

- Bio in Europe = organic in the USA
- Consumer demands for production of food and fibre, non-traditional pest control and nutritional products are growing
- USDA has interest in the terms being defined
- Terms and descriptions:
 - biorationals
 - bio pesticides
 - biological control agents
 - biologicals
 - nonexistent, ambiguous, inconsistent and confusing
- CPDA approached ASTM E35.22 Pesticide Formulations and Delivery Systems subcommittee (September 2010)
- Meeting of the Minds (1 March 2011)
- Identified and defined terms
 - biorationals
 - bio pesticides
 - biosurfactants
 - biostimulants
 - bioyield enhancers
 - bioplant health promoters
 - biosoil conditioners
- The Task Group agreed to work on:
 - "biorational", as an umbrella term under which all other terms would reside
 - "biostimulant", the US Biostimulants Coalition is working with AAPFCO on a definition
 - "biopesticide", EPA has an established definition

ASTM standard terminology related to biorationals

- Biorational. The term used to characterize a broad range of low environmental impact substances or products that are typically biologically-derived or, if synthetic, structurally similar and functionally identical to a biologically occurring material with minor differences between the respective stereochemical isomer ratios derived from biological or synthetic origins.

- Discussion: biorationals include biopesticides as well as nonpesticide products such as, but not limited to, those used for crop stress management, enhanced plant physiology benefits, root growth management, postharvest treatments or as an alternative to pesticides.
- Discussion: biorationals are used in areas such as, but not limited to, agriculture, aquaculture, forestry, plant health, industrial and residential areas.
- Scope of the term “biorational” has been published.
- Biostimulant: the Biostimulants Coalition and AAPFCO are working on a definition. Meetings are few and far between.
- Biopesticides: the ASTM Task Group could not agree on parts of the EPA definition. A proposed revision is with EPA. The Group is currently reviewing and preparing a response.

Questions/Comments: None.

6.4 CropLife International and European Crop Protection Association (ECPA) SEG

Mr Jean-Philippe Bascou, Chair of the Specifications Expert Group (SEG) of CropLife International/ECPA, noted that in addition to main member companies, CropLife represents the plant science industry in 91 countries. SEG has about 1000 members (large and small companies) through its affiliation with CropLife's regional and national organizations. Between them, CropLife members have the largest share of the so-called generic or off-patent market. Thus, CropLife speaks for the entire spectrum of the industry, not just the research and development-based (multinational) industry.

Mr Bascou focused on the work of ECPA for this year's presentation:

European Crop Protection Association

- Acts as the ambassador of the crop protection industry in Europe and represents the industry's European regional network.
- Promotes modern agricultural technology in the context of sustainable development.
- Represents the crop protection industry in relevant European forums on behalf of its major stakeholders and the wider public.
- Endeavours to listen to and learn from its stakeholders and the public, and seeks to understand their interests, views and perspectives.
- Advocates policies and legislation that represent a scientific and risk-based approach, fosters innovation, protects intellectual property and rewards the introduction of new technologies and practice.

Mr Bascou outlined the role and activities of the SEG. The group comprises representatives of member companies with expertise in analytical, physicochemical, regulatory and formulation sciences, with ad-hoc members from other areas of expertise (for example, toxicology and ecotoxicology). The SEG is a technical resource for CropLife and ECPA, which was established to enhance good specification quality and to promote consistency and harmonization in registration requirements. Its mission is to provide a forum comprising experts in matters of product quality and specifications for discussion and resolution of technical issues of importance to the Crop Protection Industry and to promote harmonization.

The key activities of SEG include:

- Preparing the document “Working with the JMPs to establish an FAO/WHO specification: a manual for the pesticide industry”
- Engaging in and supporting the work of CIPAC

- Coordinating efforts with other expert groups (e.g. DAPF, DAPA, ESPAC, Phys-Chem. Industry forum)
- Leading the introduction of new or revised or updated MT methods (MT46 for LN)
- Introducing annually analytical methods for use in specifications as reference methods (e.g. Brodifacoum, Permethrin (chiral), Pyriproxyfen, Toluene) as relevant impurities in Formulations, Transfluthrin (Chiral) Trifloxystrobin
- Commenting on new or revised OECD methods on physicochemical properties Providing and maintaining industry technical monographs (TM):
 - use of tolerances in the determination of active ingredient content in specifications for plant protection products (TM1)
 - catalogue of pesticide formulation types and international coding system (MR & XX) (TM2)
 - guidelines for specifying the shelf-life of plant protection products (TM17)
 - minor changes of formulants contained in formulations (TM19)
- Supporting ECPA and CLI regulatory teams on:
 - formulation changes (management at zonal level)
 - opinion on SANCO document on dRR templates
- Supporting CropLife in:
 - Latin America on equivalence workshop/training (e.g. Mexico City, Mexico, September 2013)
 - Africa and Middle East on equivalence workshop/training (e.g. Hammamet, Tunisia, March 2014)
 - confidential business information concept in connection with equivalence procedure (e.g. Nairobi, Kenya, (January 2014))
 - Asia/India workshop on bridging concept in connection with change of composition in formulations (e.g. New Delhi, India, November 2013)
- Seeking improved harmonization
- Conducting survey on the country uses of the FAO/WHO tolerances
- Organizing regulatory meetings of ECCA and ECPA (March 2014)
- Fully supporting the transparency concept providing it does not endanger:
 - confidential business information
 - data protection

Questions/comments

(i) For the survey that CropLife International plans to conduct on the use of tolerances for active ingredient content, will national authorities or members of CropLife International from each country be asked to respond to the survey?

Mr Bascou replied that CropLife will ask the registration teams from its member companies that submit the dossier to national authorities to answer the survey. In particular CropLife is interested in finding out if the dossiers are accepted when the FAO tolerances are used or if the tolerances need to be changed to meet national requirements.

(ii) Could CropLife International share the results of its survey with FAO and WHO? Mr Bascou responded that in principle, as the purpose of the survey is to improve harmonization, CropLife International would be willing to share the results pending confirmation from CropLife members.

6.5 European Food Safety Authority (EFSA)

Mr László Bura presented the developments on pesticides at EFSA and future plans:

Main responsibilities of the pesticides unit

- Coordinating the peer review of active substances
 - Providing conclusions for single active substances to support EU decision-makers
- Supporting the scientific panel for pesticides PPR (plant protection products and their residues):
 - opinions
 - guidance documents
- Maximum residue levels (MRLs)
 - reasoned opinions
 - annual report

Outline of the peer review process

- Submission of dossier
- Evaluation by RMS
- Assessment report drafted
- Peer review:
 - EFSA, rapporteur MS, other MSs,
 - EU Commission, Notifier, Public
 - commenting phase
 - evaluation of comments
 - expert consultation
 - conclusion
- EFSA conclusion → Commission
- Standing Committee on the Food Chain and Animal Health (SCoFCAH = EC +MSs)

EFSA conclusions overview

- 73 conclusions published since 1 January 2013
 - new active substances (Reg. 188/2011)
 - confirmatory data
- New elements for 2014
 - first conclusions on AIR II
 - first conclusions on new active ingredients (Reg. 1107/2009)

PPR panel

- A total of 21 independent scientific experts, covering:
 - chemical active substances
 - microbiological active substances
 - physicochemical properties of pesticides
 - methods of analysis of pesticides
 - toxicology and regulatory toxicology
 - non-dietary exposure and risk assessment of pesticides
 - dietary exposure and risk assessment of pesticides residues in food and feed
 - environmental fate and behaviour of pesticides
 - ecotoxicology
 - ecology and population dynamics
 - ecological/environmental exposure and risk assessment.
- Outputs for 2013
 - Good modelling practice (7 March 2014 Scientific Opinion PPR Panel)
 - Developmental neurotoxicity potential of acetamiprid and imidacloprid (17 December 2013 Scientific Opinion PPR Panel)

- Relevance of dissimilar mode of action (3 December 2013 Scientific Opinion PPR Panel)
- Panel guidance on tiered risk assessment for edge-of-field surface water (18 July 2013 Guidance PPR Panel)
- Cumulative assessment groups for pesticides (12 July 2013 Scientific Opinion PPR Panel)
- FOCUS groundwater: assessment of higher tiers (28 June 2013 Scientific Opinion PPR Panel)
- FOCUS groundwater: assessment of lower tiers (27 February 2013 Scientific Opinion PPR Panel)
- PPR scientific opinions are a starting point for PPRR or EFSA guidance

Developing a guidance document: typical sequence of events

- Identification of a need/drafting of a mandate
- Collection of data
- Opinion of the PPR Panel
- Establishment of a Working Group
- Preparation
- Consultations
- Adoption (or approval) of the guidance
- Entry into force

Procedure for setting MRLs

- Initiated by PPP applicants, growers, importers, food producers, MSs
- Includes a dossier with:
 - GAP (good agricultural practice)
 - residue data package (Annex II, chapter 6)
 - toxicological data package (if no EU ADI/ARfD)
 - analytical methods for monitoring/enforcement of MRL in the relevant crop (Annex II, chapter 4.2)
- The rapporteur MS produces an evaluation report
- EFSA scientific staff assess the information and conduct a consumer risk assessment

MRL reasoned opinions

- Risks to consumers (and animals) associated with the MRL
- Analytical methods for routine monitoring and limit of detection
- Mammalian toxicology key values
- Acceptable daily intake and acute reference dose
- Nature and magnitude of residues in plants
- Nature and magnitude of residues in livestock
- Consumers risk assessment (PRIMo)
- About 50 reasoned opinions per year reviewing MRLs for approved/non-approved active substances (Art 12 ROs)
- About 60–70 reasoned opinions per year for new proposals and modifications of existing MRLs

Questions/comments

What is the difference between the adoption of a guidance document and its approval by EFSA?

Mr Bura replied that guidance can only be adopted by ESFA or the PPR panel. A guidance document is approved when all MS and the Commission have had an opportunity to vote on the document at the Standing Committee meetings.

Who sets the timelines for the entry into force of a guidance document?

Mr Bura replied that the timelines are set by the EU Commission.

6.6 American Federation of Agrichemical Societies (FASA)

Ms Monica Luna introduced FASA and presented its activities to the meeting:

- Participated in Central America Customs Union Round Meetings
 - Objective is to harmonize regulations for:
 - customs
 - drugs
 - food for animals
 - sanitary and phytosanitary measures
 - certification of seeds
 - veterinary products
 - registration of agrochemicals
 - others
- Progress
 - Normative approval (approved by the World Trade Organization, WTO)
 - pesticides for household and professional use
 - harmonized labelling regulations for household and professional pesticides.
 - microbial Pesticides.
 - botanical pesticides (99% progress)
 - harmonized labels and pamphlets for chemical pesticides (90% progress)
- Financed and organized a visit for Panama officials to Costa Rica to learn about fiscal audit and exchange, and disposal of pesticide containers.
- Along with the Ministry of Agriculture of Honduras, developed a seminar on good agricultural practices and marketing techniques for indigenous women farmers.
- Participated as a speaker at the Latin American Congress of Toxicology (Guayaquil, Ecuador, October 2013).
- Delivered a health education programme on occupational safety and use of pesticides in El Salvador, in coordination with the Ministry of Health and the centre for technology transfer (CENTA).
- Participated in the Inception Workshop for the Preparation of the document “State of the Environment Report, Honduras 2013”
- Participated in the Technical Committee meeting of Pesticides of Panama, COTEPA, along with national organization APAN.
- Active member of the Honduras National Committee of Chemical Substances
- Joined the Sub Committee of Pesticide Residues in Honduras.
- In Nicaragua FASA and ANIC organized and participated in the Regional Congress of Toxicology
- Sponsored and participated in the Coordinating Group of Pesticides
- Participated in the Board of the Caribbean 2014 annual meeting.

Questions/comments: None.

6.7 Global Fund to Fight AIDS, Tuberculosis and Malaria (the Global Fund)

Ms Joelle Daviaud, Quality Assurance Specialist, Geneva, presented the Global Fund's experience in procurement of pesticides.

PSM (procurement and supply management) principles

- Procure quality-assured products in a transparent and competitive manner
- Secure the most adequate form to support adherence (fixed-dose combinations, paediatric formulations)
- Fix the lowest possible price
- Adhere to applicable national laws and international agreements
- Supply systems: capacity to ensure an uninterrupted supply of health products while minimizing risk of wastage and diversion
- General principles of procurement:
 - best value for money
 - fairness, integrity, transparency
 - effective competition
 - grant funds may only be used to procure pesticides that are recommended for use by WHO Pesticide Evaluation Scheme (WHOPES)

Quality control requirements for procurement of IRS products

- Select IRS approved by WHOPES (formulations/manufacturers)
- Systematic manufacturers certificate of analysis review at pre-shipment level
- Random pre-shipment testing by an independent quality control laboratory
- Sampling by an independent sampling agent
- Testing:
 - quality control testing by ISO 17025 certified laboratory, WHO Collaborating Centre for Quality Control of Pesticides
 - according to WHO methods and specifications
 - post-shipment testing if risk identified after receipt of products

Monitoring the quality of pesticides: Why? How?

- WHO specifications for pesticides define the essential chemical and physical properties associated with the efficacy and the risk of use of a product
- Poor-quality pesticides
 - can result in inadequate application of the product
 - increase the risk for users and the environment
 - lead to ineffective control and potential development of resistance
- Quality control is essential to:
 - minimize risks associated with handling of pesticides and their use
 - guarantee their efficacy and stability during storage

Quality of pesticides: WHO recommendations

- All public health pesticides offered for sale should meet WHO specifications, when they exist.
- When WHO specifications do not exist, any other relevant internationally accepted or national specifications should be considered.
- The bidder must provide evidence that the product offered complies with the relevant specification.
- A certificate of analysis should be provided by the supplier for each batch of product at the time of delivery.
- Independent control of the quality of the product should be determined through independent analysis by the procurement entity:
 - choosing an independent certified or accredited laboratory,
 - each batch should be tested for compliance with the specification.
 - random sampling of samples when appropriate
 - shipment of samples to the selected laboratory,

- quality control according to methods referenced in WHO PES pesticide specifications/other internationals specifications if needed.
- the analysis should not be limited to the active ingredient content but should include all the physical and chemical properties specified in the WHO specifications or other relevant specifications.
- reporting by the selected laboratory.

Implementation

- Process systematically followed for all VPP/PPM procurements (since 2012)
- Process implemented by most of the PRs (as of 2014)
- Challenges encountered
 - low number of IRS formulations approved by WHO PES
 - difficulty in obtaining appropriate formulation as requested by the country
 - delays in delivering appropriate IRS
 - difficulty in replacing the IRS selected in case of quality failure
 - completed CoAs not provided
 - no randomization of lots tested could be applied, increase of QC, and delay in shipping the IRS
 - shipment sent and distributed in country before sampling
 - considerable delay in sampling and QC testing

Quality control results, 2013–2014

Year	Total number of samples tested	Number of non-compliant samples	Percentage of non-compliance
2013	371	145	39
2014	108	43	40

Failed parameters

Parameter	Total number tested	Number of non-compliant parameters	Percentage of non-compliance
Active ingredient	478	58	12
Dissolution rate of water-soluble bag	160	54	34
Impurities (except water)	40	3	8
Persistent foam	398	38	10
Suspensibility	358	49	14

Challenges in quality of IRS products procured

- Impacts
 - Programmatic: spraying or larvicide period missed
 - Financial: product replacement/destruction, air versus ocean, road transport, level of efforts
 - Reputational: weaken trust in the reliability of suppliers and quality/safety of IRS

Supplier engagement

- Supplier meeting held (Geneva, April 2014)
- Dialogue initiated between the Global Fund and suppliers of IRS products and other partners

- Current situation and challenges discussed
- Future plans and expectations shared
- Key actions to progress identified

Conclusions

- Procurement of appropriate IRS in due time is still challenging for many programmes
- The lack of pesticides of assured quality has delayed the use of LLINs and IRS by countries and in some cases for more than one year:
 - no spraying before the rainy season
 - great public health significance in particular by contributing to insecticide resistance.
- Meet with relevant partners to discuss and improve IRS specifications and quality testing protocols
- Work towards increasing the range of approved IRS products and the number of qualified laboratories
- It is not enough to be ISO certified; it is equally important to have certification for the scope of work for IRS products
- Questionnaire to identify appropriate laboratory under development

Questions/comments

WHO recognizes the importance of showing the relevance to the work of this meeting in terms of setting quality standards and appreciates that the Global Fund follows and uses WHO recommendations and quality standards. Will policy be implemented to prevent sub-standard pesticides being delivered? It is important to realize that the late delivery of an insecticide for malaria control means epidemics and death. Quality control is very important, but unless policy is devised or penalties are implemented to avoid provision of sub-standard pesticides the problem will continue.

Ms Daviaud replied that the Global Fund is currently developing new procurement processes, for example considering if the tendering companies are WHO/PES accredited or not, and whether or not to implement penalties for companies that fail to meet the procurement quality standards. It is also important to work with the manufacturers and testing laboratories to find out the reasons for failing to meet quality standards, and to work with companies to improve their systems. We also need to look at the history of product quality failure of that manufacturer as well as WHO/PES product testing. In our experience, even if manufacturers and laboratories get different test results, there have not been any problems with failure of products after this initial discrepancy in some cases. The reasons for disagreement of test results can be as simple as manufacturers not strictly following the exact method details as outlined in a certain CIPAC MT.

The Global Fund has started to map the availability of quality control laboratories. What steps should be taken when a laboratory does not have the necessary capacity to cover an area? Could funding be provided to ensure that at least a couple of suitable laboratories are available in each region for use by Member countries?

Ms Daviaud responded that the Global Fund can finance programmes for certain laboratories where gaps have been identified. The Global Fund will not insist that each country develops its own testing laboratory but instead suggests that a number be available in each region; this need has already been identified and the Global Fund is working on this issue.

6.8 Other organizations

There were no other organizations present who wished to give a report.

7. National reports regarding CIPAC activities and reports from official quality control laboratories

The following country reports, including any collaborative studies in which they participated, were presented: Austria, Belgium (2 reports: for agriculture and public health), China, Czech Republic, El Salvador, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Netherlands, Panama, Romania, Slovenia, South Africa, Spain, Switzerland, Thailand, Ukraine and the United Kingdom. Annex 1 contains a summary of the reports.

National reports that were provided electronically are available on the CIPAC website (<http://www.cipac.org/datepla.htm>).

Questions/comments

Several comments were made about the new template being used to submit the results and the difficulties of some national laboratories in its use.

Dr Hänel stated that the purpose of the new template was to be able to distinguish between the number of samples analysed and the number of tests conducted on each sample. He observed that the form has been interpreted by different laboratories in different ways. The revision of the template was ongoing and any comments should be sent to CIPAC for further consideration.

8. Status, review and publication of CIPAC methods

Dr Hänel reported that the review of handbooks G & H was completed. Based on the review it is proposed that 7 methods in Handbook G and 26 methods in Handbook H should be regarded as obsolete; this is mainly due to the use of packed GC columns. The finalized proposal will be placed on the CIPAC website with a call for comments in due course.

Preparation of the next handbook is still under way. Further discussion about the format of publications (handbooks and CD-ROMs) will take place during the CIPAC Management Committee meeting.

Further information on CIPAC methods and publications is available on the website www.cipac.org

9. Subjects from the 13th JMPS Closed Meeting

The following significant issues and new matters were raised in discussions held in the JMPS Closed Meeting. These were presented by Dr Markus Mueller, Chairman of JMPS, to the FAO/WHO/CIPAC Open Meeting.

Revision of the FAO/WHO specifications manual (November 2010)

- Since 2010, a number of issues were identified in the manual that need correction (mainly from CropLife SEG)
- Some clarifications and procedural changes were introduced (checklist, description of confidential manufacturing process)
- Amendments accumulate year by year and are currently listed in a table
- Amendments are more difficult to reference
- FAO and WHO plan to incorporate the amendments into a revised and consolidated version of the manual (by late 2015).

3rd revision of the first edition of the specifications manual by late 2015 will include:

- Consolidated version with all comments adopted by CropLife SEG

- Procedural changes including revision of reference profiles (see below)
- Auxiliary documents such as checklist included
- Model specifications updated and corrected (see below)
- Appendices J–K updated, corrected or removed, where appropriate
- Before publication: consultation of a semi-final draft with industry.

Revision of reference specifications for TC and formulated products

- Procedure for revision of reference specifications was discussed and agreed
- Categories:
 - with and without extensions to equivalent products
 - changes to better define quality or include new aspects

Revision procedures (to be included in the manual)

- References without extensions: published after adoption in JMPs
- References with extensions but existing clauses better defined:
 - adoption of reference specification
 - short period for second manufacturers for submission of data
- Publication of revised specifications for complying companies
- References with extensions but new clauses:
 - adoption of reference specification
 - adequate period for second manufacturers

Deficiencies in data packages submitted for equivalence determination

- Data packages for equivalence often incomplete because:
 - CIPAC methods are not used
 - published peer-validated methods for relevant impurities are not used
- Need for “bridging studies”, but waste of resources
- Please consider data requirements!
- Specification manual may cause difficulties for subsequent manufacturers to understand data requirements
- Data package for submission for reference and equivalence: checklist available
 - Checklist: Annex 1 in “Specifications for pesticides: a training manual”

Ongoing revision of specification manual: CropLife comments

- CropLife SEG comments were discussed and accepted by the majority
- To bridge time to publication of the revised FAO/WHO manual, an “Amendment to the Manual” will be amended with the 2013 and 2014 items
- SEG comments on revision of the manual are most welcome and extremely useful
- JMPs thanked SEG for their valuable comments (discussed on Saturday afternoon)
- Many edits, but also technical points.

Proposal for revised and new model specifications

- WP and WG formulations packed in SB:
 - Separate templates for neat and SB-packed formulations were developed and available
- New formulations:
 - MR (matrix release) for vector control
 - Long-lasting treated bag (LB) for agriculture
- New and revised model specifications
 - After clarification of some points will be published on FAO and WHO websites

Increasing number of pending applications

- JMPS is concerned about the increasing number of pending applications:
 - often due to trailing or absent communication with some companies
 - sometimes difficult to confirm registration of a certain active/formulation by national authorities
- Joint efforts to reduce pending submissions needed
 - Advice from industry is welcome
 - WHO and FAO will make better use of country representations and regional offices to contact national authorities and offer support
 - A number of submissions with significant data gaps and insufficient support of proposers are withdrawn by JMPS
- Withdrawal published on FAO and WHO websites

Questions/comments: None.

10. Review and publication of FAO and WHO specifications for pesticides

10.1 Status of FAO specifications

Madam Yang presented the status of FAO specifications shown as tables (Annex 3).

10.2 Status of WHO specifications

Dr Yadav presented the status of WHO specifications shown as tables (Annex 4).

10.3 Status of Joint FAO/WHO Specifications

Dr Yadav presented the status of Joint FAO/WHO specifications shown as tables (Annex 4).

Dr Yadav indicated that during 2014, five requests that were scheduled for evaluation and had already been assigned to evaluators were cancelled because either the dossier was never submitted or the proposal was withdrawn during evaluation.

11. FAO/WHO priority list and programme for development of FAO and WHO specifications for pesticides

Dr Yadav presented the list of priorities for JMPS 2015 (Annex 2) in three different categories: (1) original proposer; (2) subsequent proposer(s); (3) specification for formulation.

There are 19 proposals including several for new reference specifications; this is a full agenda for the next year. The specification of a new molluscicide for use in public health is being proposed. Snails are vectors for schistosomiasis in some parts of Africa and in Indonesia.

12. Any other matters

No other matters were discussed.

13. Date and venue of next meeting

At the request of the Chairperson, Dr Helen Karasali announced that the CIPAC/FAO/WHO Annual Meeting in 2015 will be held in Athens, Greece. A presentation was shown of the meeting venue.

Provisional dates for the JMPS and CIPAC meetings were announced as 10–18 June, 2015. Dr Karasali was looking forward to welcoming all participants to Athens next year. Further details are available on the CIPAC website (<http://www.cipac.org/datepla.htm>).

14. Closing of the 11th Joint CIPAC/FAO/WHO Open Meeting

Dr Rajpal Yadav, Chairperson of the meeting, thanked Dr Olivier Pigeon and his team for their hard work in organizing the meeting, Dr Hänel and Madam Yang for their continued collaboration, the participants for their attendance and the rapporteurs for their work. He declared the meeting closed.

ANNEX 1.
SUMMARY TABLE OF NATIONAL REPORTS OF OFFICIAL QUALITY CONTROL LABORATORIES

Region	Reporting laboratory	Number of samples tested	Non-compliance	
			Number	%
Africa	South Africa	530	1	0.2
Americas	EI Salvador	620	20	3.2
	Panama	126	1	0.8
Asia	Japan	24	0	0
	China	4488	675	15.0
	Thailand	501	88	17.6
Europe	Austria	34	3	8.8
	Belgium (public health)	370	145	39.2
	Belgium (agriculture)	83	6	7.2
	Czech Republic	67	25	37.3
	Germany	222	21	9.5
	Greece	330	9	2.7
	Hungary	1385	49	3.5
	Ireland	164	4	2.4
	Italy	6458	3	0.05
	Netherlands	29	0	0
	Romania	123	11	8.9
	Slovenia	32	1	3.1
	Spain	339	10	2.9
	Switzerland	17	10	58.8
	Ukraine	107	15	14.0
	United Kingdom	61	3	4.9
Total		16 110	1100	6.8

ANNEX 2.
PROGRAMME FOR DEVELOPMENT OF FAO AND WHO SPECIFICATIONS FOR PESTICIDES

(1) Original proposer; (2) Subsequent proposer(s); (3) Specification for formulation

Year	Products	Proposer(s)
2015		
1.	Clethodim TC, EC, WG	(1) Arysta LifeScience (JSC International Limited)
2.	Flucarbazone TC, SC, OD, WG	(1) Arysta LifeScience (JSC International Limited)
3.	Propisochlor TC, EC	(1) Arysta LifeScience (JSC International Limited)
4.	Amicarbazone TC, SC, WP, WG	(1) Arysta LifeScience (JSC International Limited)
5.	Prochloraz TC	(2) Jiangsu Huifeng Agrochemical Co. Ltd., China
6.	Glyphosate TC	(2) Jiangsu Huifeng Agrochemical Co. Ltd., China
7.	Trifofloxystrobin TC, Ai, EC, FS, SC, WG	(1) Bayer CropScience, France
8.	Hexazinone WG (TC add-on)	(3) Nutrichem Co., China
WHO		
1.	Lambda-cyhalothrin 10 WP (TC add-on)	(3) Bharat Rasayan, India
2.	Deltamethrin WT (TC add-on)	(3) Gharda Chemicals, India
3.	1R-trans-phenothrin TC	(1) Sumitomo Chemical, Japan
4.	d-phenothrin TC	(2) Endura, Italy
5.	Bactivec (<i>Bti</i>) SC	(3) Labiofam, Cuba
6.	Deltamethrin (polyester coated) LN (Moskitul)	(3) SPCI SAS, France
7.	Bendiocarb WP-SB 400 g/kg	(3) Bayer CropScience, France
FAO and WHO		
1.	Alphacypermethrin TC*	(2) Hemani Industries, India
2.	Propoxur TC, 50 WP	(2) Tagros Chemicals, India
3.	Metaldehyde TC	(1) Xuzhou Nuote Chem. Co., Ltd., China
4.	Niclosamide-olamine TC	(2) Sichuan Academy of Chem Industry Research & Design, China
5.	Permethrin 40:60 TC	(2) Yangnong, China

*Withdrawn by the manufacturer

ANNEX 3.
STATUS OF PUBLICATION OF FAO SPECIFICATIONS

Product	Manufacturer	Status
Imidacloprid TC, WG, SL, SC, WS and FS	Cheminova	Published
Nicosulfuron TC, OD	Cheminova, Rotam	Published
Permethrin TC (40:60)	Tagros	Published
Thiamethoxam TC, WG, SC, FS	Syngenta	Published
Azoxystrobin TC	Helm	To be published
Copper compounds	European Union Copper Task Force	To be published
Fluazinam TC, SC	ISK Biosciences Europe	To be published
Glyphosate TC	Helm, Monsanto	To be published
Thiacloprid TC, SC	Cheminova	To be published
Clothianidin WG	Sumitomo	To be published
Clothianidin TC, FS, WS	BCS	Pending data from company
Fosthiazate TC, GR	Ishihara Sangyo Kaisha	To be finalized for publication
Fenazaquin TC, EC, SC	Gowan	Pending data from company (CIPAC method to be reviewed in 2014)
Cyazofamid TC, SC	ISK	To be finalized for publication
Chlorfenapyr TC, SC (revised specifications)	BASF	To be finalized for publication (subject to the WHOPES recommendation)
Diflubenzuron TC	Helm	Pending data from company
Triflumuron TC, WP, SC	BCS	Pending data from company

ANNEX 4.
STATUS OF PUBLICATION OF WHO AND FAO/WHO JOINT SPECIFICATIONS*

Year	Product	Manufacturer	Specification	Status/ date published
2011	Deltamethrin SC-PE	Bayer	FAO/WHO	May 2014
	Permethrin (40:60 cis/trans) TC	Tagros	FAO/WHO	Oct 2013
	Pirimiphos-methyl CS	Syngenta	WHO	Pending
	Chlorfenapyr TC, SC	BASF	FAO/WHO	Finalized
2012	Alpha-cypermethrin WG, WG-SB	Tagros	WHO	Finalized, awaiting WHOPES testing
	Spinosad DT, CG	Clarke/Dow Agro	WHO	Jan 2014
	Temephos TC	Fersol	WHO	Pending
	Diflubenzuron TC	Helm	FAO/WHO	Pending
2013	Permethrin non racemic 25:75 TC	Bayer	WHO	Pending
	S-bioallethrin+permethrin +PBO EW (Aqua reslin)	Bayer	WHO	Pending
	Bendiocarb-WP80-SB	Bayer	WHO	Jun 2014
	Deltamethrin WG-SB	Bayer	WHO	May 2014
	Bifenthrin TC	Bharat & Rotam	FAO/WHO	Pending
	Brodifacoum TC, CB, RB, BB	Syngenta	FAO/WHO	Pending
	Chlorpyrifos TC	Bharat	FAO/WHO	Pending
	Deltamethrin TC, WP	Rotam	FAO/WHO	Pending
	Malathion TC	Sinochem	FAO/WHO	Pending
2014	Alpha-cypermethrin (coated) LN (Mapomol Safenet)	Mainpol GmBH, Germany	WHO	Reviewed by JMPS, June 2014
	Alpha-cypermethrin (incorporated) LN (MiraNet)	A-Z Mills, United Republic of Tanzania	WHO	
	Alpha-cypermethrin +PBO (incorporated) LN (Veeratin)	VC Innovations, India	WHO	
	Permethrin (incorporated) LN (Aka net)	Kuce Lace Co., Japan	WHO	
	Permethrin+pyriproxyfen (incorporated) LN (Olyset Duo)	Sumitomo, Japan	WHO	
	Review of alpha-cypermethrin (incorporated LN) – bursting strength	Shobikaa Impex	WHO	
	Deltamethrin WG	Rotam and Gharda	WHO	
	S-methoprene TC, XR-G	CLS, USA	WHO	
	B. sphaericus+Bti (VectoMax) FG	Valent BioSciences, USA	WHO	
	Deltamethrin WG25-SB	Tagros, India	WHO	
	Lambda-cyhalothrin TC	Youth, China	FAO/WHO	
	Bifenthrin TC	Jiangsu, China	FAO/WHO	
	Permethrin TC (40:60 cis:trans)	Gharda, India	FAO/WHO	

*As of 23 June 2014

Specifications of long-lasting insecticidal nets (as of 23 June 2014):

Full specifications published since JMPS meeting, June 2013	Interim specifications pending finalization of full specification (2011–2013)
<ul style="list-style-type: none">• Olyset• Olyset Plus• PermaNet 2.0; Extra• Yorkool• Duranet, MagNet, Royal Sentry	<ul style="list-style-type: none">• DawaPlus 2.0• LifeNet• PermaNet 3.0• Interceptor