CONFERENCE/WORKSHOP ORGANISER'S REPORT

Advancing Sustainability in Agriculture: Enabling Precision Application of Crop Protection Products by Inclusion in Regulatory Approaches (Processes) (EPAC 2026)

Short name *Crop-Protection-Products-&-Regulation*

Melbourne, Australia on 19-20 February 2026

Brief Description of what the conference/workshop was about

The two-day conference was about developing a regulatory understanding of the latest innovations in precision application (PA) of agricultural chemical products and explore what is required to support precision application technologies within regulatory frameworks. Regulatory risk assessments need to capture what is new without placing excessive regulatory burden on industry and ensure labels convey information in a way that helps users and supports compliance and enforcement activities.

The first day consisted of 18 technical presentations from experts from key sectors including regulators from Canada, Europe, UK and Australia; leading researchers and equipment manufacturers; the crop protection industry and growers and grower representatives. This provided an overview for the audience of the latest global initiatives in PA in advance of the second day in which delegates participated in a hands-on workshop focusing on 4 key topics:

1) Definitions, classifications and use patterns
2) Building trust in the technology
3) Risk assessment approaches and identifying/addressing regulatory gaps
4) Label language and supporting precision application

The outcomes from this conference are now provided to OECD Co-operative Research Programme (CRP) in this short report and subsequently in a 'perspectives paper' to be published in the Journal of the American Society of Agricultural and Biological Engineers (ASABE) to help shape a future programme of work in this area.

Participation – details of total number of participants, countries they came from, backgrounds (academia, industry, etc.)

The conference was attended by 185 delegates (in person and online and some of which attended the first day only) from a wide range of stakeholder groups, including regulators from the EU, UK, Canada, Australia and NZ, research and academia, equipment manufacturers, the crop protection industry, growers and grower representatives. The gender balance of delegates was 108 male and 77 female (58% compared to 42%, respectively). A breakdown of the total number of participants by country and background is given in Appendix A.

Major highlights from the presentations

The conference was opened with a traditional 'Welcome to Country' by Uncle Ian Hunter, a respected elder of the local Wurundjeri people, in recognition of the traditional custodians of the lands upon which the conference was held. The Assistant Minister for Agriculture, Fisheries and Forestry, Senator Chisholm, was scheduled to

speak but at the last minute was unable to attend and his message of support on behalf of the Australian Government was delivered by the APVMA Board Chair Ms Catherine Ainsworth. The program of 18 technical presentations was split by sector beginning with those from regulators followed by the crop protection industry, grower and machinery experts, and finally, the research sector. Each presentation was 20 minutes and questions from the audience were captured by 'Slido', an audience interaction program, and due to time constraints are being addressed by the relevant speaker post conference. A high level of satisfaction was expressed by delegates concerning the quality and diversity of the speakers and their presentations. A total of 75 delegate responses to the OECD CRP Conference Survey were received (57 in person and 18 virtual delegates). The approx. 50% response rate for those who attended both days indicates a high level of engagement from participants and 99% of respondents rated the conference good, very good or excellent. Results from the OECD CRP survey are summarised in Appendix B.

Major outcomes/conclusions in terms of policy relevance

The conference was informed of a range of ongoing international initiatives underway that feed directly into the ambition to incorporate PA technology into regulatory processes. The work of the OECD Drone/Uncrewed Aerial Spray Systems (UASS) Sub-Group (ODSG), OECD Digital Label Community of Practice, European Precision Application Task Force (EUPAF) and ASABE and ISO (International Organization for Standardization) equipment standards, in particular, are key initiatives that underpin this work. As reflected in these initiatives, a key message from the conference was the need to ensure all stakeholder groups are involved in the process including regulators, crop protection industry, growers, equipment manufacturers and researchers. The other key message is that in order for a wide adoption of PA technology and to fully realise its potential benefits, growers must be kept at the forefront of policy recommendations and approaches. The following outcomes / themes and recommendations have at their heart these two principles.

i) There is a strong consensus for the need for harmonised definitions, classifications and test methods to keep pace with PA development and enable international alignment.

- The development of ASABE standard S665 and related ISO standards are an important foundation for regulatory confidence and risk assessment assumptions relating to the performance of PA. Trust hinges on validated detection/decision algorithms and equipment performance and evidence based assumptions feeding into risk assessment calculations.
- Publish a harmonised glossary and classification framework for PA (aligned with ISO/ASABE/ European and Mediterranean Plant Protection Organization (EPPO)/EUPAF where feasible) with clear mapping to GAP tables and pictograms which is essential to frame the risk assessment. The OECD is considered a good forum for this given its greater global reach and ability to pull together outcomes from existing activities.
- The technology is fast moving and any classification framework will need to be regularly reviewed and updated. As far as possible, terminology should be 'future proofed' (e.g. reference standards are not explicitly stated but referred to more generically in terms of their outcomes).
- Benchmarking and classification of PA platforms will simplify labels.

ii) Introduce tiered risk assessment pathways that start from broadcast worst-case and allow refinements for % treated area, drift reduction, and site-specific conditions.

- Recognition that PA can lower environmental loading and human exposure while maintaining (or improving) efficacy and profitability.

- The proposed PA GAP definitions and use reduction classification system from EUPAF is a good foundation for a common understanding of the range of PA equipment/techniques and associated reduction in % area treated but wider international agreement, cross walking, and validation is required.
- Develop tiered, low-risk regulatory steps leveraging existing models and guidance (including EUPAF proposals) while collecting data to close gaps.
- Building on the work of EUPAF, widen the scope of case studies to jurisdictions outside the EU to help regulators identify key issues and risk assessment approaches based on real world examples or relevance in their respective countries. A pilot approach working with growers and grower representatives, the crop protection industry and regulators to identify and test key use patterns data requirements and pathways to registration is recommended.
- Consideration and development of the use of PA as a risk mitigation option and for options as to how to implement site specific exposure and risk assessment options for use by growers to reflect their local circumstances.
- Risk assessment relating to non-target organisms will have different effects depending on type and location of non-targets in the field and where they feed. Understanding the comparative exposure and risk between PA/increased dosing and standard applications and understanding and quantifying the actual deposition profile and exposure pathway reductions to non-target species needs to be addressed.
- Consideration of pre-mapped areas and prescription application of % area treated could be utilised now to allow risk reduction/mitigation for application using PA.
- Identifying scenarios and exposure / risk assessment areas where average field rate approach could be used such as the environmental ground water assessment, residues in blended commodities and operator exposure assessment.

iii) Strengthen training/accreditation and post-market validation programs with industry/Research and Development Corporations (RDC); encourage minor-use permits/case studies to generate early evidence.

- Minimum training standards for growers are not sufficient for PA systems. There is a need to develop training support tools such as apps and simulators to help growers readily access the latest information and ensure compliance with label requirements.
- Growers need support to navigate their way through the plethora of information and services (which app, which sprayer, which digital platform?), which can act as a barrier to adoption due to grower time constraints and concern about investing in the wrong options for their circumstances/needs. “Single source of truth” and aligned approaches were emphasized as useful mechanisms to minimize the overwhelming amount of resources for growers.
- Growers need to understand what the return on investment will be and over how long. Use of premium products would be acceptable if optimal control and long-term weed seed bank reduction is achieved, even at the expense of some localised crop damage.
- As identified by the ODSG, codes of practice or best management practice guidance (for PA) is needed so all can understand what best practice looks like. It supports training and enforcement activities and can provide a level of information that can’t easily appear on the label.
- The majority of what is applied to a crop using conventional broadcast techniques never hits the intended target and better tech alone is not enough. Regulation that makes it easier for cheap generic products to enter the market and can lead to poor outcomes. Less than optimal coverage can lead to resistance and undesirable impacts on the environment (contaminated water, degraded soils, lost beneficials, etc). Growers need to see what coverage is currently being achieved and what could be achieved such that behaviours change towards maximising coverage and improving outcomes.

iv) Adopt outcome-based, equipment-agnostic label language; use machine-readable digital/e-label content/QR codes to deliver detailed instructions and updates; express dose by treated area/canopy/biomass where appropriate.

- Preference for outcome-based, simple, equipment-agnostic labels supplemented by digital/e-label content to handle complexity. Outcome-based label language might include things like an expression of a droplet quality (e.g. fine, medium, coarse, etc.) rather than a specific droplet size which might change as standards change.
- Labels are already complicated and the added complexity of PA could make this worse. Simplicity is key on a physical label and initiatives towards digital labelling are critical to improving accessibility and readability of information. Digital technologies utilized in the submission steps, could also potentially simplify addition of precision label language in a way that reduce the risk of "opening up the whole label" for registrants. The pictograms developed by EUPAF for 2D (i.e. 'horizontal' crops such as cereals, vegetables, etc. where the spray is directed downwards) and those under development for 3D crops (i.e. 'vertical crops' such as tree fruit and vines where the spray is directed sideways and upwards) were considered very useful to aide understanding of type of PA intended but would need to be harmonised.
- There is likely to be reluctance and confusion amongst growers in any attempt to move away from existing dose expression approach of 'rate of product per hectare' at least for 2D crops although there may be merit in expressing dose as a 'rate of product per treated hectare'. There may be more flexibility with 3D crops with leaf area index (LAI) or similar approaches.

v) Codify digital record-keeping expectations (maps, conditions, parameters) in a technology-neutral way; support secure, tamper-evident data options.

- There is an expectation that digital record-keeping will improve compliance monitoring and traceability without creating undue burden for users although issues around data ownership and security would need to be addressed.
- Capping of % area treated on labels could be implemented to support risk assessment assumptions and enforcement activities. Systems could be set so that once a limit is approached a warning is given and the system stopped or to fallback mode when the limit is reached. This would rely on the existence of digital labels interacting with the digital platform controlling the spray operation. More immediately, % area treated restrictions may not be enforceable without prescription maps and it would be necessary to construct a regulatory framework to support this.
- If there are areas within a field of application that warrants no application (i.e. critical habitat, run-off vulnerability, or spray buffer), a grower/applicator can place a geospatial no-spray-zone within the GPS map and the system will automatically not spray in that area. Alternatively, setting such no spray areas could be done by suitable applications in future that are informed about vulnerable areas and how they need to be protected.

<u>Recommendations</u>

Taking the input from the conference and the work of relevant working groups such as EUPAF into account, the EPAC 2026 Technical Committee recommends the creation of an OECD Working Party on Pesticides Expert Group that would work to:

1. Develop a bank of case studies illustrating the implementation, performance range, exposure reduction potential and applications of PA categories and use of the tiered approach for the risk assessment; EUPAF initial examples could be utilized as a starting point while the proposed

OECD WPP Expert Group would have a focus on OECD member country agricultural areas outside the EU. Case studies could include the following:

a. Publish a harmonised and future proof set of definitions, glossary and classification framework for PA, widened to represent all other regions beyond Europe;

b. Propose reduction classification systems enabling the inclusion of PA in the regulatory dossier and being simple and practicable for inclusion on labels;

c. Propose a tiered approach to the risk assessment, leveraging existing models and guidance, building on EUPAF proposals and case studies;

d. Develop proposals on the process for regulatory agencies to validate exposure reduction potential of different PA scenarios.

2. Develop a best management practice guidance to support OECD countries with the recognition of PA and support development of training material as well as the development of supportive data by the relevant stakeholders to build grower trust.

3. Ensure the link is made with digital labels and compliance support solutions, in particular, with the OECD Community of Practice outcome on digital labels.

Relevance to CRP theme(s)

(I) MANAGING NATURAL CAPITAL:
There are several environmental (and economic) benefits that can be attributed to the existing and emerging use of precision application technologies for pesticide application, as these technologies help growers and contract applicators adhere to the 4 R's (right place, right rate, right substance, right time). The agricultural imperative to feed a growing global population while minimizing inputs and increasing productivity and sustainability concurrently is likely to be reliant on the adoption of precision application technology. However, these benefits to 'natural capital' (e.g., improvements in agricultural sustainability that benefit land, soil, water and biodiversity while significantly contributing to Integrated Agricultural Production Systems*)* will not be fully realized unless precision applications are included in the regulatory reviews and approval processes by competent national / regional regulatory authorities of OECD (and non-OECD) countries.

Incorporation of the reduction in exposure into regulatory risk assessment, review processes and approaches should make environmental and ecological benefits of precision application clear to growers, contract applicators and the societies that agriculture serves; leaving these benefits unaccounted for in regulatory risk assessment, review processes and approaches will create a disincentive and hamper the introduction and adoption of precision application technologies – as the benefits to 'natural capital' will not be transparent nor officially recognized. The conference represents another step in progressing the effort to incorporate precision application into pesticide regulatory exposure and risk assessment.

(II) STRENGTHENING RESILIENCE IN THE FACE OF MULTIPLE RISKS IN A CONNECTED WORLD
The continued development and implementation of precision application technologies for pesticide applications will increase the resilience of the agricultural system by assuring pesticide applications are made accurately where they are needed to manage pests while concurrently reducing potential exposure to humans and the environment. The benefits of precision application technologies could be particularly important to sensitive areas that have increased protection goals, such as threatened or endangered species habitats or areas targeted for natural restoration. It also provides an opportunity to increase the use of biological control methods for which accurate monitoring, timing and placement can be critical to their effectiveness. The ability to retrofit these technologies (e.g., machine auto-steer, individual nozzle control) makes these benefits more accessible to growers and pest management operators as these technologies become more scalable across operations of all sizes due to the lower price point associated with retrofit options. Access to precision application equipment can also be achieved by utilizing a contract application provider or service that employs these technologies (e.g. contract service providers may help overcome the financial cost of precision application equipment or provide technical support to improve adoption of technologies). Precision application can also be of benefit for the management of invasive species by assuring placement of control agents where they are needed to prevent establishment of unwanted populations whilst doing so with reduced chemical input. More accurate placement of substances at the appropriate dose for the intended target could improve efficacy and reduce the likelihood of sub-lethal doses being delivered.

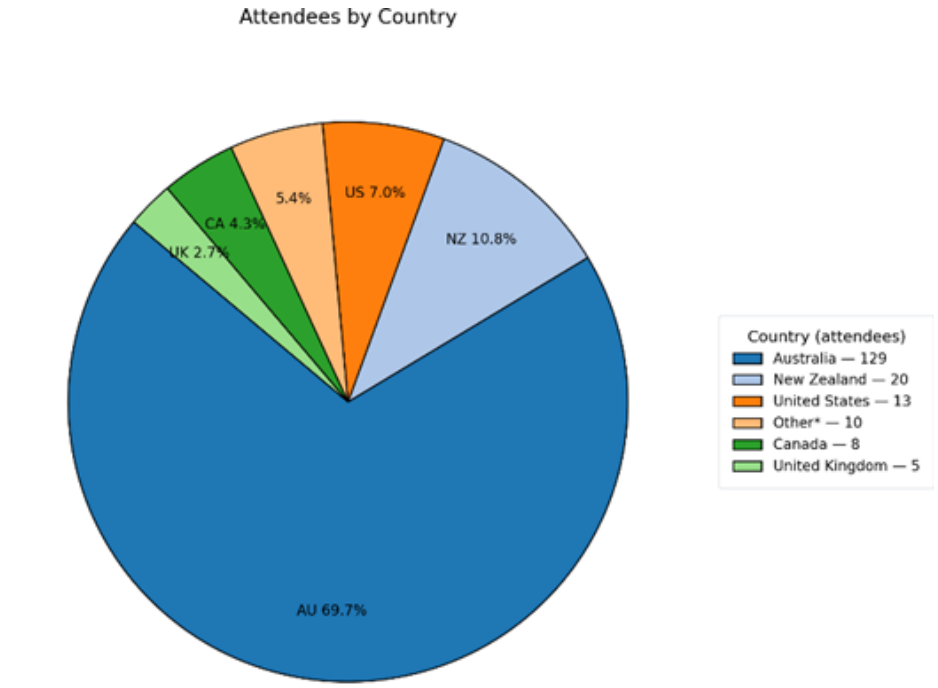
The drivers for adoption of precision application technologies by growers will likely vary with multiple factors (e.g., field / farm size, crop mix, access to new use patterns, openness to new technologies and return on investment) but all countries and agricultural areas are and will be impacted by the lack of pesticide regulatory guidance on precision applications of pesticides.

(III) TRANSFORMATIONAL TECHNOLOGIES AND INNOVATION
Precision application technologies are at the forefront of the introduction of the digital / 'big data' era in agriculture as these are application methods normally linked to a prescription, scouting and/or sensing result (including real-time sensing i.e. while the application is in progress) which improves delivery of a pesticide(s) to target the intended pest in small or irregular areas within a larger potential use area. The implementation of precision application methods also brings forward the potential for field level / site specific implementation of pest management practices as part of an integrated whole farm approach to production; the transformational impact of the real-time risk assessment to inform precision applications of pesticides provides a powerful incentive for continuing to work to reap the benefits of digital agriculture. As technologies continue to evolve at an ever more rapid pace it is very important that regulation enables the adoption of these technologies to allow growers to benefit from their use and better protect human health and the environment by reducing the exposure or risk to pesticide applications and address many of the issues currently facing agriculture, such as labour shortages, rising chemical costs and climate change. It also becomes ever more important for those overseeing these regulations to continue to engage with industry and academia to stay up to date with the latest application technologies being introduced and implemented in the marketplace.

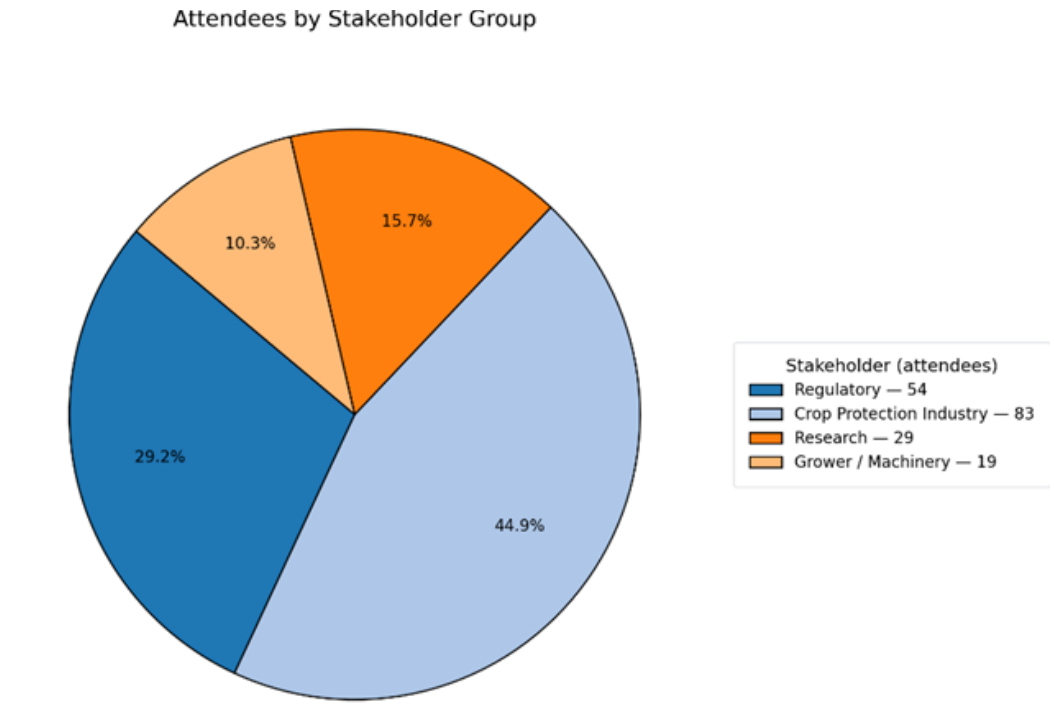
Website for further details – please also indicate if the presentations are/will be available on the website

The recorded presentations and pdf copies as well as a copy of the presentation given to the 41st meeting of the OECD WPP on 27th February 2026 summarising some key themes can be found on the outcomes page of the EPAC 2026 website https://www.epac2026.org/outcomes .

Appendix A: Breakdown of participants by country and stakeholder group

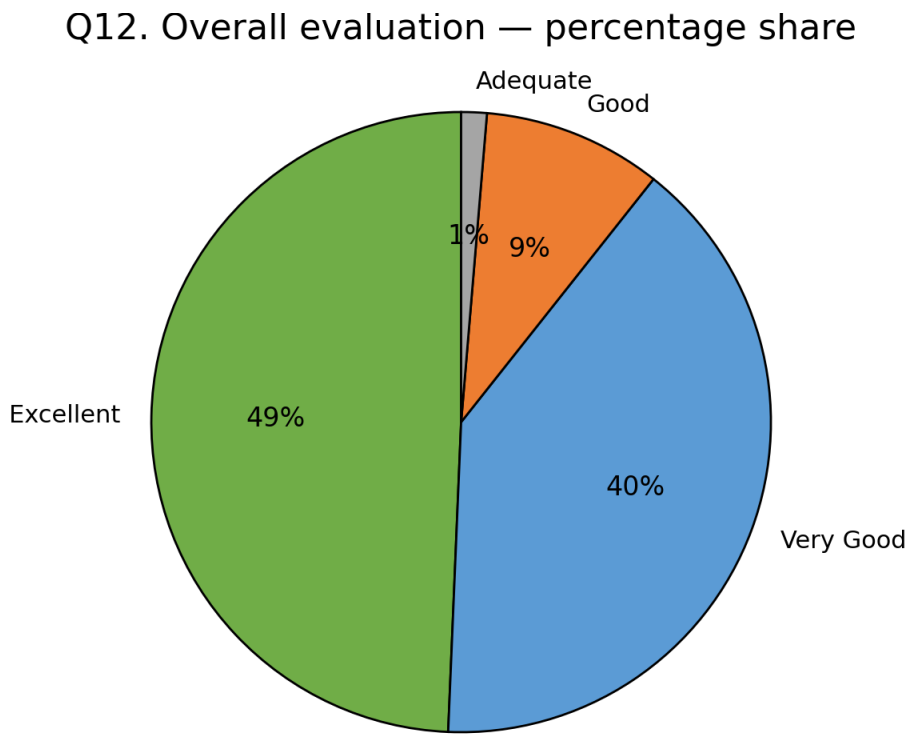


*Other includes: Singapore (2), Germany (2), Belgium (1), Spain (1), Switzerland (1), South Korea (1), Italy (1), Brazil (1)



Appendix B: Summary of some answers to the OECD CRP survey

Of the 75 responses received 73 delegates said the conference met their expectations and 74 considered it useful in terms of scientific information and collaborative links. Delegates were asked to provide an overall evaluation (unsatisfactory, poor, adequate, good, very good and excellent) and the results are shown below.



In addition to the overall evaluation, delegates were asked to provide further comments which are available in the OECD CRP spreadsheet of results file. Key themes relating to reasons for positive responses as well as areas for improvement are shown in the following tables.

Further comments: key themes

Reasons for positive response (top 5 themes)

Theme	Mentions	% of comments	Representative quotes
Overall positive & informative	30	41.7%	Excellent organisation and great topics. Overall, EPAC was a great opportunity to interrogate some of the emerging challenges in regulation of PA and drones.
Networking & attendee mix	26	36.1%	Very good range of speakers and highly informative; Excellent conference, great networking. Maybe organised seating for dinner may have allowed more interaction between unknown parties and networking.
Speakers & program quality	22	30.6%	Very good range of speakers and highly informative; Excellent program, well run and extremely informative and timely.
Workshop sessions valuable	11	15.3%	So many speakers first day wonder if speakers then workshop; speakers then workshop and repeat the next day would have been better; Good, interactive workshop sessions.
International perspectives beneficial	6	8.3%	One of the best & most effective gathering of cross disciplinary and cultural conferences. Disappointing not all OECD member nations represented. The conference provided good international collaboration. Would have been nice if the majority if not all speakers could have been at the conference in person.

Areas for improvement (top 5 themes)

Theme	Mentions	% of comments	Representative quotes
Agenda pacing & time for Q&A	16	22.2%	A very broad topic to cover in 2 days. A lot more time needs to be spent on this topic as industry and technology is leaving regulation behind.; Very well organised, strong attention to detail. Perhaps a fraction too long on both days.
Local/Australian content & regulator presence (APVMA/EPA)	10	13.9%	EPAC was a very useful conference that kept me engaged throughout despite serious jet lag! I'd like to see commitments from APVMA to get up to speed - Organisers are not at fault, but attendance of US EPA would have been beneficial to the global discussions.
Virtual/hybrid & tech issues	9	12.5%	The IT video presentations also worked well.; There were a couple technical hiccups but to be expected, overall I thought a good experience for virtual attendance. Interesting program and speakers, maybe having a little more time for Q&A with the different speakers.
Venue & logistics (seating, spacing, coffee)	8	11.1%	Chairs uncomfortable, tables first day would have been useful; The food was good, the coffee was terrible, location was good. The dinner provided a great balance for social interaction.
Content balance & commercial tone	5	6.9%	Only suggestion would be that perhaps an aerial drone manufacturer could have been invited. Eg DJI or XAG. Provide over the horizon view on next 5 years. The presentations by the spray equipment companies were too commercial. I thought the balance of the topics in the program were about right. The major issues were dealt with.