iPlanta Webinars : RNAi based pesticides

The first series of 3 webinars discussed the science and development of RNAi based pesticides and some of their biosafety and regulatory issues. Webinar 1 was introduced by Prof Bruno Mezzetti (Chair of iPlanta Cost Action) and chaired by Dr Jeremy Sweet (Vice-chair iPlanta) and discussed the development of RNAi based pesticides, the new opportunities and environmental biosafety issues.

Prof Neena Mitter (Univ. of Queensland) gave an introduction to RNAi activity particularly in relation to plant virus control and discussed issues around the persistence and efficacy of topical applications of dsRNA. She described the research of her group on the formulation of dsRNA using nanoparticles referred to as bioclay which improve the survival of dsRNA in the environment and thus improve the efficacy and persistence of spray applications for virus control. She discussed related studies using bioclay formulations for dsRNA targeting some pathogenic insects and fungal species and was enthusiastic about the future prospects of this technology. She anticipated that regulators in Australia will approve the use of some products classified as biopesticides.

Dr Kaat Capelle described the work of a team at Syngenta on developing a transcriptome wide RNAi screen in a model coleopteran, the rice weevil. This included the prerequisites of a low maintenance, easily rearable insect that is sensitive to oral RNAi with a well defined transcriptome. The process required high throughput dsRNA production and oral bioassay platforms. They had identified numerous target transcripts in adult weevils, of which approximately one third had not been identified before.

Dr Ethan Barnes (GreenLight Biosciences) discussed Ledprona, a foliar-applied double-stranded RNA bio-insecticide for control of Colorado potato beetle. He described work on the impacts of formulations, application rates and doses on efficacy and persistence of the product in field trials in USA, Europe and Canada. Ledprona can be tank mixed with other agrochemicals and Ledprona is on track to be commercially approved and available in USA in 1-2 years.

Dr Salvatore Arpaia (ENEA) discussed some of the environmental safety issues of RNAi as used in plant production and protection. He described the studies that had been done on the biosafety of transgenic plants expressing dsRNA targeting pests, by both industry and independent researchers. These studies had focused primarily on the persistence of dsRNA in the environment, routes of exposure and non-target and off target effects. His presentation provided a lead in to the second webinar which discussed some of these biosafety issues in more details and their relevance for consideration of topical applications of dsRNA.

Throughout the webinar, questions had been posted on Zoom and some were addressed at the end of each presentation while others were discussed by all presenters in a discussion session at the end of the webinar programme.

The video of the meeting, the presentations and the report can be found at the following links:

https://www.iplantawebinars.com/event/5fbea30d64f9a93dadc07288

https://iplanta.univpm.it/node/79