

## SCIENCE POLICY FORUM ON IMPACTS OF AND ALTERNATIVES TO SYSTEMIC PESTICIDES

April 19, 2016 – held at York University

Attended by Diane Szoller

Ontario's new regulations on neonicotinoid insecticide use as part of a wider strategy to promote pollinator conservation is extremely important but neonics and other systemic pesticides are used elsewhere as well in agriculture – as foliar sprays, soil drenches and seed treatments in horticulture, turf grass production, golf courses and other applications and even in flea and tick treatments for pets. Further knowledge is needed on their effects (especially on soil and aquatic biodiversity) and on the development of alternatives, such as biological control, in IPM.

Members of the International Task Force on Systemic Pesticides (TFSP) came together as an independent group of 30 scientists globally to work on a Worldwide Integrated Assessment (WIA) of the impact of Systemic Pesticides on Biodiversity and Ecosystems. Their mandate was “to carry out a comprehensive, objective, scientific review and assessment of the impact of systemic pesticides on biodiversity, and on the basis of results make any recommendations needed with regard to risk management procedures, governmental approval of new pesticides, and any other relevant issues that should be brought to the attention of decision makers, policy developers and society in general. Their work involved a synthesis of 1,121 published peer-reviewed studies spanning the last five years, including industry-sponsored ones. Key findings were presented in a special issue of the scientific journal “Environmental Science and Pollution Research” January 2015. Visit <http://www.tfsp.info/>.

Since the 1950's, root causes of insect decline are the intensification of agriculture, the manifold increase in roads and motorized traffic as well as continent-wide nocturnal light pollution and nitrogen deposition. They concluded these phenomena reflect the now general collapse of Europe's entomofauna. They also noted this coincides with a severe decline of different insectivorous bird species up to now considered common – swallows and starlings. Based on existing studies, numerous observations in the field and overwhelming circumstantial evidence, they came to the hypothesis that the generation of pesticides introduced in the early 1990s, are likely to be responsible at least in part for these declines.

### Speakers

Laurence Packer, Faculty of Science, York University – (keynote speaker at ACE Pollinator Forum, 2014). He discussed the taxonomic, ecological and behavioural diversity of wild bees. See publication - 'Bees of Toronto guide, City of Toronto Biodiversity Series (organized by his students), 800 species in Canada.

Maarten Bijleveld van Lexmond, Chair TFSP, Neuchâtel, Switz. TFSP set up in 2009, now counts 17 nationalities in four continents as members. In undertaking the WIA over last four years, the TFSP has examined the catastrophic decline of insects all over Europe. WIA was launched June 2014.

Jean-Marc Bonmatin, Deputy Chair TFSP, CNRS –Center for Molecular Biophysics, Orleans, France. He discussed WIA research on agricultural use of neonics and impact on biodiversity. Conclusions support further restrictions of prophylactic neonic uses in favour of IPM practices or that of organic farming. Bee declines show combined stresses from parasites, pesticide use and lack of pollinator friendly flowers.

Nigel Raine, Rebanks Family Chair in Pollinator Conservation, School of Environmental Sciences, University of Guelph. Impacts of systemic pesticides on bees: from individual behaviour to pollination services were examined in a 2 year study. Main sources of exposure were found from wildflowers, not target crops. Impacts included behaviour changes, colony function and pollination services. Implications found involved worker learning, memory, pollen foraging, flower choices, colony reproduction/growth.

Elizabeth Lurnawig-Heitzmann, TFSP Public Health Working Group Secretary, Marinduque, Philippines. Given the absence of marketing regulations, neonics are sold under multiple trade names. Pesticide regulatory process is pro-industry. In response to the WIA, the governor of province, declared ban of all usage, sale and import of neonics and Fipronil to protect island's famous butterfly breeding industry.

Kumiko Taira, TFSP Public Health Working Group Chair, Tokyo Women's Medical University, Japan. Human health impacts of exposure to neonics showed recent memory loss and human neonic exposure ranges from headaches, fatigue, chest pain, stomach ache to fever or neuropsychiatric symptoms.

David Kreuzweiser, Research Scientist, Canadian Forest Service, NRCan. Risks of neonics to soil invertebrates include pervasive use, high degree of persistence under some considerations especially moist, organic-rich soils and biodiversity hotspots. Earthworms – harmful effects expected at realistic concentrations, risk of mortality, behaviour effects lowering cast production, but uncertainties remain.

Jean-Marc Bonmatin, spoke again on alternatives to neonics. A new law on biodiversity in France has created a network of protected areas representative of biodiversity. Various measures include specific objectives, constraints and management methods for obligations at international and European level, national regulatory protection, land-control policy and protection and contractual land management.

Lorenzo Furlan, Chair of TFSP Working Group on Alternatives, Veneto Agricoltura, in co-operation with University of Padua, Italy. A new strategy for agriculture without use of neonics. Protection of growers by mutual insurance against pitfalls: alternatives to neonics in arable crops. Area wide risk assessment of field monitoring to estimate farmland left untreated each season without risk of yield reduction. IPM thresholds a balanced means of damaged risk caused by various factors and surface area of cultivated land. Chemical treatment only used when risk is minimized. IPM use - Directive 2009/128/EC.

Graeme Murphy, IPM and Biological Control Consultant, Welland, Ontario. IPM and alternatives to systemic pesticide application in Ontario horticulture discussed. He wants new research on monitoring, alternative controls, new products, economics. Greenhouses generally have voluntary insect removal.

Charles Vincent, Saint-Jean-sur-Richelieu Research and Development Centre, Agriculture and Agri-Food Canada. Alternatives to insecticides - reality check. For sustainable agriculture and growing consumer demand, growers need sound alternatives to insecticides. Management method must meet several criteria – notably technical efficacy, practical efficacy, commercial viability, sustainability public benefit and compliance with laws and regulations. His experience includes 5 alternatives being – netting for bird control, development of a botanical, development of a viral bio-insecticide, classical biological control of European Apple Sawfly and blueberry maggot with extreme cold temperatures.