1659i AGRICHEMICAL EXPOSURE IN AUSTRALIAN FARMERS – MONITORING, MEASURING AND MAKING A DIFFERENCE

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Exposure to organophosphates at low levels over time has been associated with neurological conditions. In-field Personalised Cholinesterase Assessment Project (PCAP) is identifying the effect on cholinesterase (ChE) inhibition in Victorian (Australia) farmers caused by the application of organophosphates (OPs) and ChE inhibiting insecticides. Accurate field assessment is particularly important for remote rural communities and current available measurement does not accurately estimate individual risk.

Funded by the Shepherd Foundation and commencing in April 2016 this work trials an innovative, transportable assessment tool, identifying farmers with reduced ChE activity, who are at risk of neurological symptoms and/or unknown chronic low level exposure. Using oxime regeneration to stimulate recovery ChE *in vitro*—a more accurate and meaningful estimate of the percentage inhibition of cholinesterase—is generated for the farmer. This new approach will provide farmers with instant results from a measurement tool using their own ChE inhibition range.

Validated across 10 time points in 5 Victorian farming locations, the study involves 61 farmers and agricultural workers (crop and/or livestock) aged between 20–75 years. This presentation will discuss the results generated using this novel, objective and portable field test including post participation behavioural changes.

This research is providing farmers with fast evidence of personal exposure with individual results, resulting in practice change, attitude shift, prevention of further exposures and possible reduction or change of pesticide use.

1659 j BIOMONITORING OF OCCUPATIONAL EXPOSURE TO CONAZOLE FUNGICIDES IN AGRICULTURE WORKERS

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Introduction Pesticide exposure in agricultural workers may be investigated using biomonitoring, i.e. the measurement of pesticides or their metabolites in easily accessible specimens. However, the scarce information on the fate of pesticides in the human body may impair this approach. This work aims to show the strategy developed to perform biomonitoring of the exposure to tebuconazole and penconazole, fungicides widely applied in the vineyard.

Methods Metabolites of tebuconazole and penconazole in workers urine were identified using mass spectrometry. The major metabolites were search prior, during and after the application of the fungicides, to elucidate the kinetics. Urinary metabolites were correlated with dermal exposure to verify their relationship with the external dose. The presence of the fungicides in workers hair prior and after the application season, was also investigated.

Results Hydroxy-metabolites of both tebuconazole and penconazole were identified as the major metabolites in humans; to a lesser extent, also carboxy-metabolites were found. Their concentration in urine of agricultural workers increased passing from prior to after the application sample and increased during the workweek, from the first to the last consecutive application; the sample collected in the 24 hours after the last application showed the maximum levels of metabolite. The correlation between urinary metabolites and dermal exposure showed Pearson correlation coefficient ranging from 0.3 to 0.7. The levels of conazoles in hair increased during the application season.

Discussions The outlined approach to human biomonitoring of conazole fungicides was successful. It opens the possibility to apply urinary hydroxyl- and carboxy-metabolites of tebuconazole and penconazole as short-term biomarkers of exposure. It also encourages further investigation on the measurement of pesticides in hair to assess long-term exposure.

1633 ORGANIC DUST EXPOSURE – BENEFICIAL OR HARMFUL?

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Aim of special session Different aspects of organic dust exposure and what health consequences they may give.

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1633a ORGANIC DUST EXPOSURE – BENEFICIAL OR HARMFUL?

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Organic dust is a mixture of particles originating from plants, animals, and microorganisms. Exposure to high levels of organic dust is common in many industries, but apart from that organic dust is ubiquitous in the environment with a decreasing gradient from livestock farming to large cities. Organic dust is a well-established or suspected risk factor for a range of diseases and conditions including hypersensitivity pneumonitis, toxic alveolitis, asthma, bronchitis and COPD. It is debated whether organic dust exposure is a risk factor or a preventive factor for lung cancer. On the other hand organic dust exposure seems to protect against allergic sensitisation and probably allergic asthma, allergic rhinitis and atopic dermatitis. Recently possible beneficial effects of organic dust