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*The occupational hygienist and the integration
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BOOK OF ABSTRACTS

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[ABSTRACT ID: 134]

QUARTZ EXPOSURE ON FARMS IN SOUTH AFRICA REPRESENTING VARIOUS SOIL TYPES

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INTRODUCTION

Although listed in some publications as an activity associated with silica (quartz) exposure, agriculture is not widely recognized as a significant risk for silica associated diseases. It could be an important public health issue not only because quartz exposure is associated with serious illnesses, including silicosis, lung cancer and increased mortality; but also, because in geographies where there is endemic tuberculosis it increases the risk of pulmonary tuberculosis. This is compounded further in poor and middle income countries (which have more than 80% of the world's population and where agriculture is often the main sector of employment) where there are high HIV infection rates because silicosis in HIV positive individuals increases the risk of contracting tuberculosis substantially.

OBJECTIVES

To quantify personal respirable dust and quartz exposure on farms with three soil types (sandy, sandy loam and a clay soil) in the Free State and North West provinces of South Africa, and to determine whether soil type is a determinant or positive predictor of "over exposure" to respirable quartz.

METHODS

Three farms in the sandy soil, sandy loam soil and clay soil region of the Free State and North West provinces of South Africa (producing typical crops for the region) were identified; and from these a total of 300 respirable dust and respirable quartz measurements were collected between July 2006 – November 2009 during major farming operations. Parametric and non-parametric tests were used to compare quartz exposure from the three different soil types.

RESULTS

Results for the clay soil are not available yet, but 18 out of the 138 (13%) and 11 out of the 76 respirable quartz measurements (14%) collected on the sandy and sandy loam soil farm exceeded the commonly used Occupational Exposure Limits of 100 µg/m³, respectively. The highest time weighted average respirable quartz concentration measured was 630 µg/m³ on the sandy soil farm, during wheat planting activities. Fifty seven percent (57%) and thirty three percent (33%) of the respirable quartz measurements on the sandy and sandy loam soil farm exceeded the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV) of 25 µg/m³ respectively. Quartz percentages of the respirable dust on the sandy soil farm ranged from 0.3 – 94.4% with an overall median of 13.4% and from 0.8 – 90% with an overall median of 13.7% on the sandy loam soil farm. Approximately 350-400 dust and quartz measurements will be presented for 10 major tasks done on all three farms.

CONCLUSION

Despite its ubiquity, little is known about quartz exposure in the agricultural industry globally; however, this study demonstrates significant potential for overexposure in some settings. Further research is required to quantify quartz exposure and identify settings and tasks which place farmers and farm workers at risk of quartz associated disease.

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OCCUPATIONAL EXPOSURE TO SOLAR UV AND PROTECTIVE HABITS IN AGRICULTURE

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UV radiation is a carcinogenic agent which has the capacity to initiate and favour skin cancers. The incidence of melanomas doubles every 15 years and has increased more rapidly than any other type of cancer in the Caucasian population.

The investigation of habits and behaviours is a priority for the development of preventive work based on professional activities considering: that solar UV radiations are responsible of 80% of skin cancers; that the prevalence of skin cancers is high and increasing; that behavioural factors and activities have a strong influence on the effective UV dose; that 1 Swiss worker out of 6 works outdoors; that there is no study on the preventive measures used at the work place in Switzerland setting up the necessary prerequisite for targeted preventive messages.

Educational messages as well as UV indicators are wide and non-specific. The main preventive measures communicated are: wear long sleeved clothes, avoid radiation peaks between 11am and 3pm, use natural or artificial shade and use sun cream. Although people are aware of the dangers related to excessive sun exposure and knowledge on the use of protective means has improved, the impact on behaviour is low. To raise public awareness on the importance of one's own actions on the daily UV exposure seems to be a far more efficient strategy.

The goal of this project is to document UV risk perception, the protective measures used in professional and non-professional environments and the knowledge and behaviour of outdoor workers using a questionnaire.

A professional activity which covers the different types of exposures was selected. Farmers were chosen in relation to the inherent risk of sun overexposure. A specific questionnaire was prepared in order to collect information on the behaviour of individuals towards the sun. In total, 4000 farmers received this questionnaire. This part of the study should bring information on the knowledge and perception of risk and bring a first large scale description of the use of sun protection in the course of a professional activity in Switzerland. This information is then put in relation with dosimetry to measure the exposure associated with a farmer's day of work.

Although risk perception related to sun exposure is different during professional activities or during leisure time, both contribute to the individual dose received. Since occupational risks span a long period and is linked to economic considerations, it tends to be underestimated by the exposed workers.

This first study on the behaviour and use of protective means in the work environment linked to individual exposure measures will enable us to elaborate targeted communication and prevention strategies as well as to diffuse messages on specific occupational prevention.

T02 - ANALYTICAL AND SAMPLING TECHNIQUES IN INDUSTRIAL HYGIENE

[ABSTRACT ID: 417]

BRITISH-DUTCH OCCUPATIONAL HYGIENE SOCIETIES GUIDANCE ON SAMPLING STRATEGY

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BACKGROUND

In 2007 the British and Dutch occupational hygiene societies (BOHS and NVvA) set up a joint working group to prepare guidance on sampling strategy for testing compliance with exposure limits for chemical agents. There is a