

Mercury — the hidden hazard of cane

By Susan Andersen

The Queensland sugar cane industry employs itinerant workers during the months of planting and harvesting of the cane crop. Working outdoors in the humid climate of tropical Queensland in the summer months has its obvious risks for workers of dehydration and sun exposure. Some risks, however, are less obvious, but have the potential to be more harmful, and possibly lethal.

Fungicide is widely used in the sugar industry. It is mainly applied to sugar cane sets (short segments of cane) before they are planted in the ground. One of the components of this fungicide is mercury (methoxyethyl mercury chloride, or 'MEMC').

Fungicides containing MEMC are restricted in their use to Queensland, NSW, Western Australia and the

Northern Territory, and can only be used on certain crops. In Australia, fungicides containing mercury can generally only be used on sugar cane. These restrictions have evolved in response to the known effects of organo-mercury compounds in the developing world, where fungicide was sprayed on grain to minimise the development of fungus and facilitate growth of the food crop. Food shortages in the developing

world resulted in human consumption of the grain intended for crop production. An epidemic occurred. Neurological disorders, gastrointestinal diseases and deaths resulted.

WHAT IS MEMC?

Methoxyethyl mercury chloride (MEMC) is an organo-mercury. It is readily absorbed through intact skin. Heat, skin lesions or broken skin can

enhance the uptake of any contaminate that can be absorbed through skin. The humid conditions favourable to the growth of sugar cane require workers to use fungicides containing mercury.

HOW IS MEMC USED?

Generally, the fungicide is sold as a concentrate and is diluted by farmers for use on sugar cane sets. If correct safety procedures are not followed when diluting the concentrate, or the instructions for mixing are not appropriately followed, mercury poisoning can occur. Farmers are also known to apply the 'add a bit extra just in case' theory when mixing fungicide, resulting in a diluted fungicide containing a greater concentration of the organo-mercurial and other chemical components than is deemed 'safe'.

The diluted fungicide is then taken outdoors to the cane field, often being left in the sun and applied to the cane sets using a mechanical planter. Of course, any farmer will tell you that farming is not a smooth operation. Machinery can break down. Cane planters get clogged with cane sets and often require manual repair. In this process, workers come into direct contact with the fungicide and mercury, which may be absorbed either via the skin or as vapour through the lungs.

Any farmer will also tell you that farming in this manner does not produce a 100% success rate with growth of the sets all of the time. Sets do not always 'take', and farmers can be left with empty lines within a field of growing cane. Some farmers accept this; others see it as unproductive, a waste of good farming land and a loss of income, and send their workers out to plant manually. Manual planting is a recipe for disaster. The ingredients are one bucket, one worker and one bucketful of fungicide. If the worker is lucky, they will be provided with a pair of rubber gloves to wear so that the skin-absorbent mercury fungicide is not coming into direct contact with their skin.

The risk of mercury exposure while planting in this manner is high. In typically hot and humid conditions, workers sweat under their gloves, and may take them off from time to time. They may wipe their mouth or face

with their hand or, even worse, stop work to eat lunch without access to water to wash their hands.

SYMPTOMS OF MERCURY POISONING

The symptoms of mercury poisoning (organo-mercurial poisoning) are diverse and could indicate any number of other medical disorders. So it is difficult to obtain a definitive diagnosis. Symptoms include a metallic taste in the mouth, tremor, headache, fatigue, difficulty in thinking, emotional instability, numbness and/or tingling of the face and fingers, slurred speech, spasticity, deterioration of mental functioning/mental capacity, rigid muscle movement, gastro-intestinal ulceration, and hearing loss.

Exposure to mercury in other compounds has different effects. For instance, metallic mercury is non-hazardous if ingested. Inorganic mercury (mercuric HG++ or mercurous HG+) has a trivial effect. Pnylmercuric acetate, which has in the past been used in paint, can cause fever, leg cramps, muscle weakness and personality changes in those exposed to the vapour while applying the paint.

THE DANGERS OF MEMC

Organo-mercurials are a significant risk to workers in the cane industry. When ingested through the skin, mercury concentrates in the red blood cells and in the nervous system. Mercury in this form is also difficult to excrete from the body. It cannot be sweated out but must be passed in the bile to the bowel to be excreted. It also has a half-life of around 65 days.

Acute organo-mercury poisoning results in gastro-intestinal tract illnesses and traces of mercury may be found there, or in the kidneys.

Chronic organo-mercury poisoning is slow and insidious. Its major effects are neurological illness involving motor neurones, fatigue, memory and thinking difficulties. Prolonged exposure to chronic poisoning may ultimately result in mercury deposits in all major organs.

Having to die to obtain the necessary evidence to succeed at trial is understandably not very palatable.

In both acute and chronic poisoning, traces of mercury may ultimately end up in the brain.

DIFFICULTIES WITH DIAGNOSIS

Fatigue and mental slowness may not prompt a cane worker to attend a doctor. If medical assistance is sought, other diagnoses are more likely to occur to a medical practitioner.

By the time a worker's symptoms have deteriorated further, the mercury absorbed into the bloodstream may already have passed into the neurological processes, and blood test results may be normal. If gastro-intestinal investigations and urine/kidney testing reveal no mercury abnormalities, a diagnosis of mercury poisoning will be difficult to obtain. In addition, the worker may not even know that they have been exposed to mercury in the workplace and therefore the patient history is unlikely to give the medical profession many clues as to the likely cause of the symptoms.

Furthermore, the medical profession may not widely recognise the risks of organo-mercury poisoning. It remains widely unreported in medical and scientific journals, as the problem has been largely confined to the developing world.

A confirmed diagnosis of mercury poisoning may in some cases be made only upon examining the patient's brain tissue. This generally happens only during autopsies, after death.

Lastly, cane workers are predominantly an itinerant workforce. Required during the planting season, they move on to other seasonal farming work, or other part-time jobs for the rest of the year. They may therefore travel from region to region, and never >>

have a constant or regular medical practitioner. In addition, overseas backpackers, or people looking for a short-term income 'top up', look to such seasonal work as a means of earning additional income.

MERCURY AND THE LAW – DIFFICULTIES WITH CAUSATION

Representing a cane worker with a myriad of neurological disorders is fraught with difficulties. It may be too late for diagnostic testing to provide a definitive diagnosis, as the mercury may have reached the worker's neurological processes. Some medical professionals may support a diagnosis of mercury exposure based on clinical signs, while other experts will not without corroborative scientific and medical data. Some experts will not proffer any diagnosis for the worker's condition. A medical report stating 'This man is clearly sick but with what and from what I do not know' is not helpful to the patient or their lawyer.

While autopsy may prove the presence of mercury in the worker's brain, under the *Succession Act (Qld)*, the worker's right to claim general damages or future economic loss does not survive their death.

For a worker, the prospect of having to die to obtain the necessary evidence to succeed at trial is understandably not very palatable.

In addition, the three-year limitation period in Queensland under the *Limitation of Action Act 1974* is unhelpful. A worker may spend the best part of three years or more after exposure being referred to a myriad of doctors of varying specialty, having test after test to eliminate other medical conditions. While an extension of this limitation period is possible under s31 of the *Limitation of Actions Act*, this gives the worker only 12 months from the date of diagnosis of mercury poisoning to commence litigation. A worker faced with such a diagnosis may take more than 12 months to work out how precisely s/he was exposed to mercury, given that most cane workers do not see the labels on bottles of fungicide, let alone are provided with a material safety data sheet by their cane grower employer.

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CAUSATION IN QUEENSLAND – FURTHER DIFFICULTIES

Mercury poisoning, like any toxic tort suffered in the workplace, is governed by the provisions of the *Workers Compensation and Rehabilitation Act 2003*. A worker cannot sue his/her employer in negligence unless s/he has an accepted claim for workers' compensation: damages can be sought only by workers who satisfy the gateway provisions of s237 of the Act.

This means that a worker must satisfy the threshold tests that apply to statutory workers' compensation entitlements before they have a right of action at common law.

Workers must therefore convince the workers' compensation insurer that their work was a significant factor in the cause of their condition.¹ Medical opinion is required and, due to the complexities of diagnosis, the opinion is often varied, both supporting and not supporting a diagnosis of mercury poisoning. A final determination is often left to the Medical Assessment Tribunal, a statutory tribunal introduced under workers' compensation legislation. A panel of three pre-eminent medical experts decides both whether the worker has a medical condition and if work is a significant contributing factor, thus deciding matters of causation:

specifically, whether the condition was caused by work.

A worker who is unsuccessful before the tribunal has no right to pursue common law damages, as the decision of the tribunal is final.

The underlying question is whether a court faced with the same plethora of medical evidence as the three pre-eminent experts would come to the same conclusion. Proof on the balance of probabilities is satisfactory for courts of law. To scientists, such proof may be insufficient. Disparity of medical opinion may provide sufficient doubt for the tribunal to find against a worker, even in situations where the worker is being treated for mercury poisoning.

CONCLUSION

Organo-mercurial poisoning can cause debilitating neurological conditions and can be fatal. Fungicides containing organo-mercurials are prevalent in the cane industry. Workers and their employers need to be vigilant in ensuring that correct concentrations are mixed and that appropriate safety measures are adopted, including the wearing of protective clothing when handling such chemicals. Workers need to report early signs and symptoms to medical professionals. Doctors need further education on the effect of these chemicals and should undertake immediate diagnostic testing to form a conclusive diagnosis. Without conclusive and early diagnosis, workers who are left unable to work due to debilitating illness will tragically not recover compensation. ■

Note: 1 To claim compensation, a worker must establish they have an *injury* within the meaning of that term in the Act. 'Injury' is defined in s32 to mean 'personal injury arising out of, or in the course of, employment if the employment, is a significant contributing factor to the injury'.

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