



A Division of the WASTE MANAGEMENT ASSOCIATION OF AUSTRALIA

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Dr M. McLaughlin
CSIRO, Land & Water Division
Waite Road
URRABRAE SA 5064

Dear Dr McLaughlin,

RE: Levels of Zinc and Copper in Compost and Mulches Used in Agriculture and Horticulture

I write to you on behalf of the members of Compost Australia and the Recycled Organics Industry more broadly. The members of Compost Australia are concerned that the maximum allowable levels in the National Biosolids Guidelines are below the levels that zinc and copper that currently occur in urban and rural environments from which we draw our feedstock.

Zinc is a natural component of composts and mulches generated from the processing of green organic materials. The green organic materials used for compost include, garden cuttings, forest and agricultural residues. The Biosolids Guidelines are taken as a defacto standard for maximum levels of heavy metals and organic contaminants in all composts and mulches (Refer Clause 2.1.1 of AS 4454 - Composts, soil conditioners and mulches). This means that any changes to the guidelines are in turn applied to the composts and mulches we produce.

I was disappointed that the seminar on "Zinc and Crop Nutrition" did not go ahead in Canberra on 8th July 2008. We had hoped that debate at the Seminar might clarify the situation with zinc and copper in composts. Such a debate would be particularly useful in light of the recent work by CSIRO, which (as I understand it) concluded that maximum allowable levels of zinc and Copper should be reduced due to fears of phytotoxicity in plants.

The Recycled Organics Industry has shown over the past 25 to 30 years that levels of zinc up to 300 mg/kg dry mass and copper up to 200 mg/kg dry mass in properly composted organic materials are not hazardous to human health or the environment. For example, average levels in composts processed in the Sydney basin are: Zinc 220 mg/kg (Standard Deviation 60 mg/kg) and Copper 65 mg/kg (Standard Deviation 40 mg/kg). No phytotoxic effects have been reported. Similar results and experience occur in other areas in Australia where green organics are composted

My understanding is that, when properly composted, the organic matter and mineral fractions form stable complexes with Zn, Cu (and Mg and Mn), thereby influencing the rate of release in soluble form (Kabata-Pendias and Pendias 1984)¹. Thus zinc and copper in the high organic matrix of compost will not behave as inorganic soluble ions when applied to soil. The plant will meet its requirements for zinc and copper, delivered by the microbial life in the soil, in the form of long chain polymers chelated to the metal ions. Thus the plant and the microbiology of the soil regulate the amount of metal ions taken up by the plant to the level required for growth.

In 2004 the Biosolids Task Force considered a submission from Compost NSW with support from NSW Agriculture that the allowable levels of zinc and copper in composts be increased. A copy of the submissions are attached to this letter. I would also point to industry experience has shown that the application of composts with 1% zinc to agricultural soils has had no adverse effects on an extremely wide variety of soil types across farming areas throughout NSW and Victoria.

Experience with composts in urban applications, which had levels of zinc above the current maximum level for unrestricted use (200mg/kg dry mass) and not exceeding 300mg/kg dry mass have also shown no reported ill effects on plants. I therefore respectfully request that CSIRO support adoption of the zinc and copper levels proposed by the Biosolids Task Force, notwithstanding the recent trial results, which we understand used inorganic zinc and copper rather than organic zinc and copper.

Yours faithfully



Peter Wadewitz
Chair
Compost Australia

CC: John Cook, Biosolids Alliance; Tony Kanak, Biosolids Task Force

¹ Kabata-Pendias, A and Pendias, H (1984). Trace Elements in Soils and Plants. CRC Press, Boca Raton, FL, 315pp.