

# Scientific research findings: mixed waste organic outputs

The NSW Environment Protection Authority (EPA) commissioned extensive research by independent scientific experts to assess the benefits and risks of applying mixed waste organic outputs (MWOO) to agricultural land, plantation forestry and mine site rehabilitation.

## Key points

- The research shows that the ongoing risks from physical contaminants (plastics and glass) and chemical contaminants in MWOO outweigh any benefits to soil quality or crop production.
- The research found the application of MWOO would need to be increased from 10t/ha to 100t/ha, to achieve any significant agricultural productivity benefit. However, this would lead to higher levels of environmental contamination.
- The outcomes of this extensive independent research program and other research commissioned by the EPA have informed the EPA's position of October 2019 on the future application of MWOO to land.



Physical contaminants such as plastic and glass have been found on land treated with MWOO.

## What is mixed waste organic outputs (MWOO)?

Mixed waste organic outputs (MWOO) is the end-product of a process which aims to separate the organic waste in household red-lid bins from other waste material.

It was previously allowed to be applied to land under strict controls, as a soil amendment.

It has been given different names by manufacturers and suppliers including Agriblend, Rehab-ARRT Rejuvenate, Pasture-ARRT Rejuvenate, and OGM (organic growth media).

In October 2018, the EPA stopped the use of MWOO after research indicated that the material provided limited benefits and posed a potential risk to the environment.

## The research program

A seven-year independent research program involved studies by the CSIRO, the NSW Department of Primary Industries, the University of Sydney, the University of New England and the Office of Environment and Heritage (now the Department of Planning, Industry and Environment).

The research findings were peer-reviewed by local and international experts.

## Major findings from research program

The independent research program identified several issues related to the use of MWOO. These included contamination of soil by small pieces of

plastic and glass, and a wide range of chemicals that are potentially toxic to humans, plants and other organisms.

The research showed the following negative impacts to soil health from the use of MWOO:

- MWOO has a fertiliser value for some soils but may also cause plant toxicity.
- Positive yield responses only occurred at application rates above 100t/ha.
- Application rates necessary for improved crop yields may be detrimental to soil biology, including organisms such as earthworms.
- Heavy metal concentrations increased when MWOO was added to soil, in some cases close to a level considered toxic to plants.
- Water movement through soil may be reduced by MWOO because physical contaminants, including synthetic fibres and rigid plastics, either partially or fully blocked soil pore spaces.
- The high salinity, ammonia and sulfide content of MWOO leachate was found to cause toxicity to aquatic organisms.
- Surface application poses a greater risk than incorporation with soil.
- Added microplastics did not cause negative effects on organisms that live in soil amended with MWOO in the short term. However, it is unclear what the effects of longer-term environmental exposures may be.

## Human health and ecological risk assessment

As part of the research program the EPA commissioned a human health and ecological risk assessment to understand whether past application of MWOO could present a risk to people on farms and the environment.

The assessment showed that the risk of exposure to the chemicals polybrominated diphenyl ethers (PBDE) and from perfluoro octane sulfonate (PFOS), for people on farms where MWOO had been used was generally low and acceptable.

An expert panel convened by NSW Health reviewed the research and has advised that it does not expect any health effects from past use of MWOO on agricultural land.

The research program found that any significant benefit derived from the application of MWOO as a soil amendment would require its application at

a rate of 100t/ha, ten times the previously permitted rates on agricultural land.

A risk assessment was also commissioned to assess the human health and ecological risks associated with an application rate of 100t/ha.

It showed that higher application rates would present greater risks to health and the environment.

## What happens next?

A period of public consultation to seek feedback on the future use of MWOO and the design and operation of the proposed transition package is open until **Thursday 28 November 2019**. Impacted stakeholders and community members are encouraged to participate so that all views, advice and information can be considered.

## Where do I go for more information?

[www.epa.nsw.gov.au/mixed-waste-organics](http://www.epa.nsw.gov.au/mixed-waste-organics)

Environment Line on **131 555**

Email: [info@epa.nsw.gov.au](mailto:info@epa.nsw.gov.au)

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### Photo

Soil showing MWOO contaminants/photo supplied/EPA]

### NSW Environment Protection Authority

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