

Heavy Metals

Page 1

OVERVIEW

- Heavy metals are elements in the environment that can become contaminants in water and soil through various activities.
- Trace metals and some heavy metals (in low doses) are important micronutrients needed for plant metabolism.
- High loads of heavy metals are a significant concern, as they can have detrimental effects on soil/growing media quality and plant health (**Figure 1**).

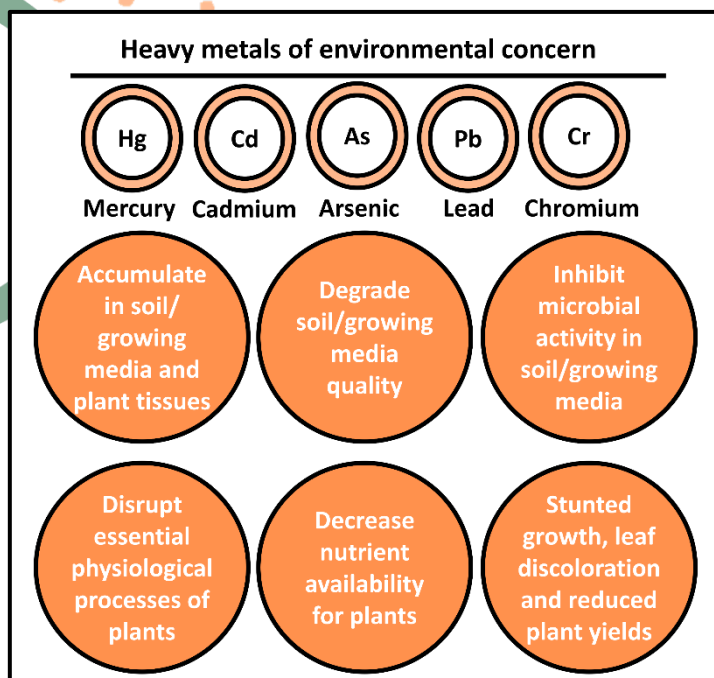


Figure 1. Some heavy metals of environmental concern and their possible effects on plant life.

KEY FACTORS

- Heavy metals can be released into the environment through natural processes (e.g., bushfires, floods) and human activities (e.g., land use, soil disturbance).
- Some fertilisers and pesticides can introduce heavy metals into soil/growing media and water.
- High levels of heavy metals in irrigation water can be toxic to plants (**Table 1**).
- The discharge of water containing heavy metals into natural water bodies or the environment can lead to pollution which can affect aquatic life and impact ecosystems.

HIGHLIGHTS

- Heavy metals can be harmful to plants and the environment.
- Irrigation water should be tested for heavy metals and consideration given to their impacts.
- Phytoremediation, erosion control, soil additives, and pre-application water treatment can reduce heavy metal availability to plants.

MANAGEMENT

- Test irrigation water sources for the presence of heavy metals on a regular basis.
- Pre-application water treatment options (e.g., filtration, coagulation, and sedimentation) can remove heavy metals from the irrigation water.
- Phytoremediation, the process of using plants to accumulate heavy metals, can be used to remove heavy metals from the surrounding land around the edges of the nursery/dam.
- The addition of soil organic matter and lime can improve soil/growing media quality and reduce heavy metal availability to plants.
- Implement best management practices, including erosion control measures, to prevent the entry of heavy metals into water sources.

Element	Limit (mg/L)	Element	Limit (mg/L)
Aluminium	5.0	Lithium	2.5
Arsenic	0.1	Lead	5.0
Beryllium	0.1	Manganese	0.2
Cadmium	0.01	Molybdenum	0.01
Cobalt	0.05	Nickel	0.2
Chromium	0.1	Selenium	0.02
Copper	0.2	Vanadium	0.1
Fluoride	1.0	Zinc	2.0
Iron	5.0		

Table 1. Recommended limits for heavy metals and trace elements in irrigation water, based on a use rate of 10,000 m³/hectare/year (ANZECC & ARMCANZ, 2000).