

# Phytoremediation of Heavy Metals Contamination with Hemp

## Why Hemp?

- Low Water Use (12" -15" per year)
- Low Fertilizer Requirements
- Hemp Kills Noxious Weeds
- High Metals Uptake
- High Tolerance for Contaminants
- Erosion Protection
- More Studies Needed

## Why Phytoremediation?

- Phytoremediation costs 5% to 10% vs. Landfill
- 90% reduction in Volume
- 90% to 95% reduction in metals from water
- Reduced Remediation Times
- Less Surface Disturbance

FIGURE 2.10.10 PHYTOEXTRACTION REPORT

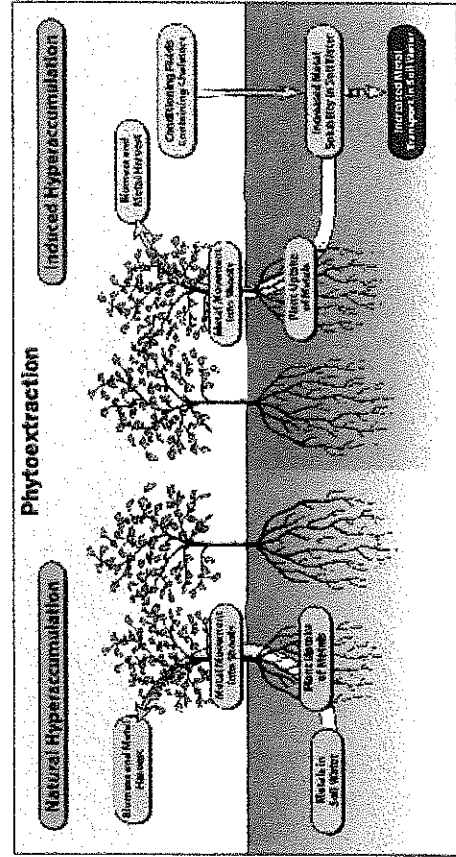


Figure 2. Natural and induced phytoextraction.

Source: Poretsky et al., 2001. Copyright Kansas State University.

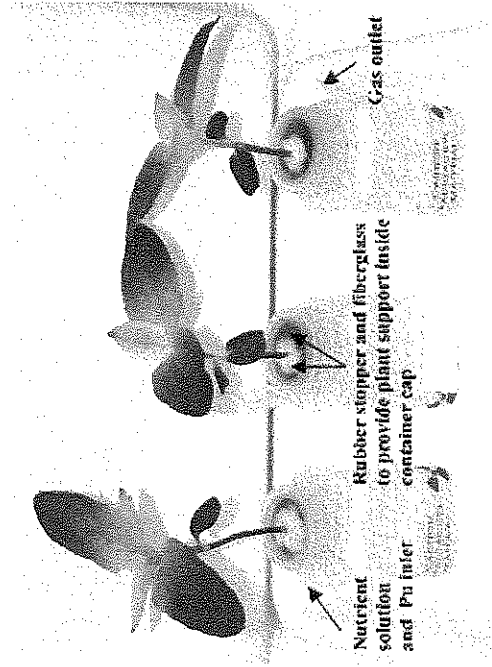


Fig. 1. Sunflower (Helianthus annuus) in hydroponic growth containers.

# Hemp Phytoremediation Studies

Hemp is suitable for growing in industrially polluted regions, as it removes considerable quantities of heavy metals from the soil with its root system and can be used as a potential crop for cleaning soil from heavy metals [Algelova et al. 2004].

This study showed that industrial hemp (*Cannabis sativa*) has a very high tolerance to benzo[a]pyrene and chrysene. Also, by growing fast in Hawaii and having a wide range of use of its seeds and fibers, hemp would be a prime candidate for remediation of PAHs-contaminated tropical areas, or be a candidate having high tolerance to PAHs for research interests [Campbell et al. 2002].

Hemp (*Cannabis sativa* L.) was used to examine its capability as a renewable resource to decontaminate heavy metal polluted soils. The influence of heavy metals on the fibre quality was of special interest. The high quality of the fibres and hurds, which were not affected by the heavy metal contamination, allows them to be used in special products like combine material. In this field trial, hemp showed a phytoremediation potential of 126 g Cd per vegetation period [Linger et al. 2002].