

PHYTOREMEDIATION OF GOLD MINE TAILINGS (2003)



RESEARCH COOPERATORS

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TRIAL OBJECTIVE

To determine the effect of humic substances (Black Earth Dry Soluble 80) on growth of medigo sativa (alfalfa) in mine tailings.

CERTIFICATIONS

Black Earth Humic products are:

- » Listed by OMRI
- » Registered with CFIA
- » Certified for use for NOP
- » Certified by the CDFA



EXPERIMENT – TAILINGS CHARACTERISTICS

Type: Gold mine tailings

Origin: Bisset, Manitoba

pH: 7.39

Density (kg/m³): 1,347

Conductivity (ds/m): 2.15

Cu (ug/g): 3,661

Fe (ug/g): 39,308

Organic Carbon (%): 0.47

EXPERIMENT – TREATMENTS

Plot Size: 0.5 x 0.5 m²

Amendment: Black Earth Dry Soluble 80 = 0, 3.9, 5.9, and 7.9 g/Kg

Fertilizer: 20-20-20 (N-P-K), 0.1% Fe, 0.05% Mn, 0.05% Zn, 0.05% Cu= 20L per plot

Duration: three (3) months

TREATMENT & ANALYSES

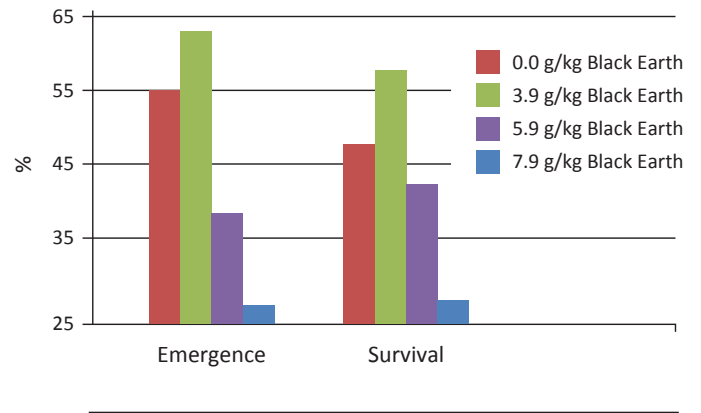
Field experiments were conducted by growing medigo sativa (alfalfa) seeds in tailings. Fertilizer was added to all treatments and Black Earth was applied according to its treatment rates. Each treatment was replicated four (4) times. The plant was harvest three (3) months after seeding.

RESULTS

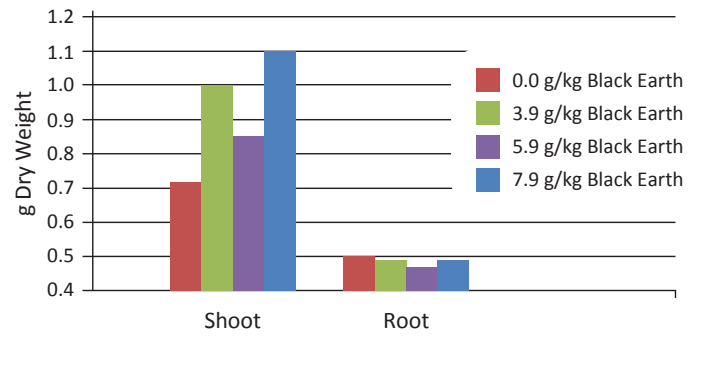
At its optimum rate (3.9 g/kg of tailings), Black Earth improved seedings emergence (4 weeks), survival (3 months), growth (3 months), and heavy metal uptakes (3 months) over control. At higher rates, Black Earth could result in negative responses, likely due to the increased of soil osmotic pressure.

Note: Black Earth is not a significant source of copper and iron.

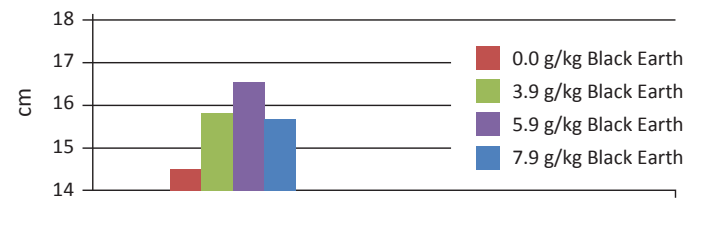
Emergence (4 weeks) & Survival (3 months)



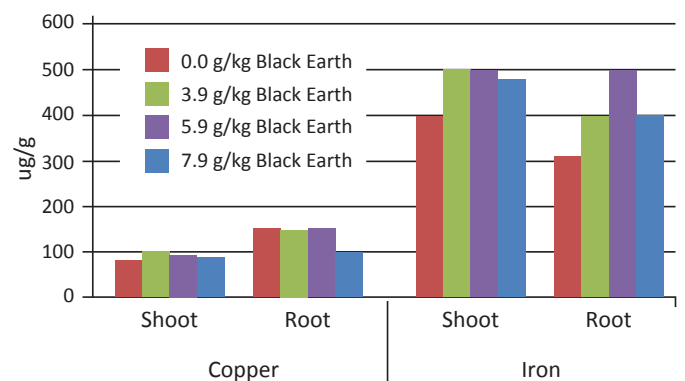
Shoot & Root Mass (3 months)



Height (3 months)



Heavy Metal Uptakes (3 months)



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