

Field Test Results (Reclamation)-2015



CHI Granule Enhanced Vegetation Growth on a Mine Site

Objective: To use organic matter (OM) products to enhance plant growth
Collaborator: Alberta Innovate Technology Future & Northern Alberta Institute of Technology
Period: April 2014 - August 2015
Tested products: CHI Granule (humic acid based OM) and Waste Sludge (industrial based OM)
Tested crops: Grass, herb, and woody species
Location: Peace River, ALBERTA
Soil: Total organic carbon = 1.2%, pH = 7.1, EC = 1.1 dS/m, nitrate N = 6.3 µg/g, total P = 10.0 µg/g, total K = 194.0 µg/g, bulk density = 1,380 kg/m³
Test plots: 25 x 25 m², each was replicated four (4) times

Design of Experiments

- Topsoil on test plots was not disturbed.
- Native grass species (awned wheatgrass and fringed brome) were seeded in April 2014 at 75 and 125 seeds/m² (corresponding to 3.0 and 4.0 kg/ha), respectively.
- CHI Granule was applied at 0.5 MT/ha; Waste Sludge at 6.2 and 15.5 MT/ha.
- Native herbs (fireweed & goldenrod) were planted in June 2015, each at 500 stems/ha.

- Woody species (green alder, dogwood, jack pine, balsam poplar, golden aspen, gray willow, and soap berry) were planted in May 2015, as well as white spruce in early-August 2015 at 4,200 stems/ha in total.
- Plant cover analyses were completed mid-August 2015 for each plot with five (5) sub-samples each.

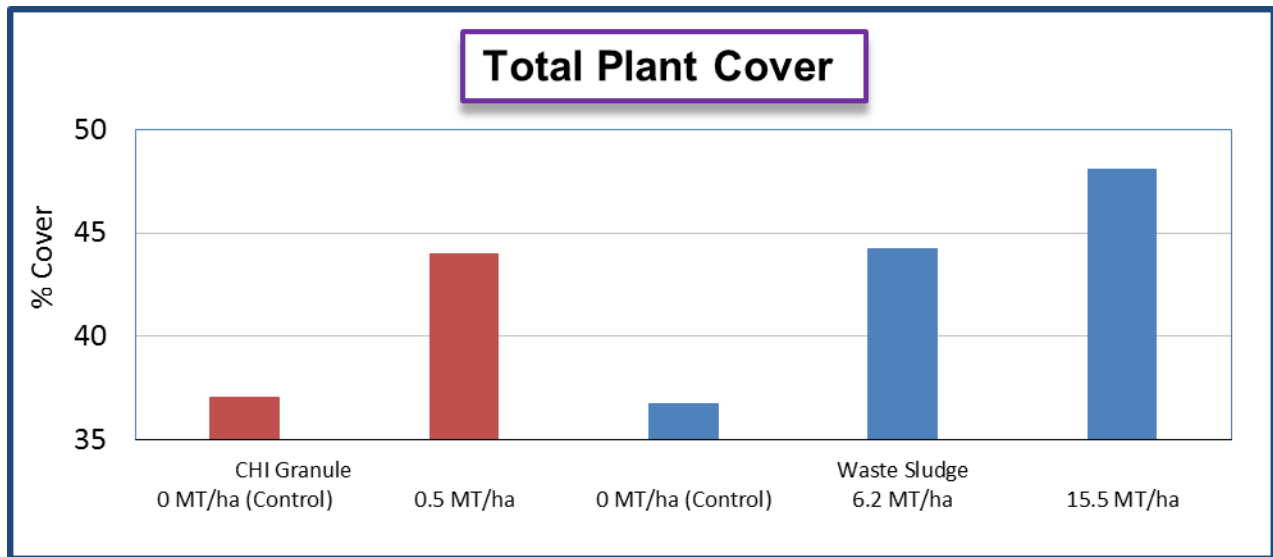
Results

In up to 16 months, CHI Granule (humic acid based OM) enhanced growth of native grass, native herb, woody as well as non-native herb species. The addition of this product increased total plant cover from 37.0 (control) to 44.0% (19% higher). Waste Sludge (industrial based OM) increased total plant covers from 36.7 (control) to 44.2 and 48.1% (20 and 31% higher), but at much higher application rates of 6.2 and 15.5 MT/ha, respectively.

Plant Cover

	CHI Granule 0 MT/ha (Control)		CHI Granule 0.5 MT/ha	
	Mean	Standard Deviation	Mean	Standard Deviation
Native Grass	5.0	5.2	5.1	6.6
Native Herb	3.8	4.8	4.2	7.0
Woody	0.2	0.7	1.9	4.0
Non-Native Herb	28.1	30.5	32.9	29.3
Total	37.0	26.9	44.0	30.1

Note: mean & standard deviation values were based on 5 sub-samples x 4 plots.



Conclusions

Organic matter (OM) products significantly enhanced the growth of plants grown on a mine site in up to 16 months. CHI Granule (humic acid based OM) increased total plant cover by 19% with an application rate of 0.5 MT/ha. Waste Sludge (industrial based OM) performed better at 20 and 31%, but at much higher application rates of 6.2 and 15.5 MT/ha, respectively.