

AGRO-LIG™ (Humates)

Typical Analysis – Dry Matter Basis

Humates	84.0%
Total Organic Matter	86.0%
Mineral Analysis: (Semi-Quantitative Spectrographic)	
Silicon	0.5%
Iron	0.5%
Magnesium	0.5%
Aluminum	0.3%
Calcium	3.0%
Sodium	0.3%
Manganese	0.02%
Titanium	0.02%
Barium	0.03%
Boron	0.01%
Copper	0.0003%
Potassium	0.07%
Cobalt	0.0002%

Agro-Lig (Humates) is a dry ground formulation of Leonardite shale from mines located in Gascoyne, North Dakota. Leonardite shale is an overlay of lignite coal beds that were produced by trees and other vegetation laid down in the Carboniferous period when that area was the tropical sunbelt of North America. Over the ages, the vegetation underwent compaction and heating and slowly carbonized and became coal. This compaction squeezed out the organic acids and esters present in the vegetation and formed a pool on top of the lignite coal bed. This pool dried and aged and eventually formed Leonardite shale. Because of its vegetative origin, this material contains naturally occurring organic acids that have distinctive properties making them economically valuable. They are currently used as sequestering agents and dispersants for oil well and water well drilling muds.

The U.S. Bureau of Mines found that these Leonardite shales (also termed Humic Acid) also had properties that caused growth stimulation in plants and improved availability of iron and other trace metals to plants.

Agro-Lig (Humates) has many benefits including: Loosens tight soil and compaction, helps to reduce soil salinity, increases water movement through the soil, stimulates composting of plowed under crop residue, increases cation exchange capacity, more rapid and increased seed germination, increases size and stem diameter of seedlings, increases top growth (better roots, moisture relationships and fertilizer uptake), increases yield of crops, stimulates soil microflora, sequesters trace elements, buffers toxic chemicals, mobilizes calcium downward into the soil, most effective when combined with fertilizers, limes or microbials. Humates are beneficial to most crops (best results obtained under adverse growing conditions).