

HealthySoil Organic Grade Humic

GENERAL INFORMATION

HealthySoil Organic Grade Humic (HOGh™) is derived from high-quality Humalite™ ore mined in Alberta Canada. Humalite™ is a coal-like material similar to Leonardite ore (lignite); however, Humalite, has higher humified organic matter content with significantly lower residuals than Leonardite mined in New Mexico and North Dakota. DRY HOGh™ is a high-quality, high-concentration and highly affordable humic acid used to amend soils.

80% Humic Acids (A&L method); 50% Humic Acids (CDFA method)*

*See back page for an explanation of each analysis.

Humalite™ has tested as the purest source of humic acid:

| | Humalite™ | New Mexico | North Dakota | ID / UT / WY |
|-------------------|---------------------|---------------------|--|---------------------|
| %Humic Acid (avg) | 50% CDFA 80% A&L | 35% CDFA 70% A&L | 43% CDFA 51% A&L | 40% CDFA 70% A&L |
| %Ash | 11% | 35% | 21% | 84% |
| CEC | >200 | 55-70 | 100-140 | 100-140 |
| Parent Material | Sub-bituminous coal | Lignite | Sub-bituminous coal; Carbonaceous shale | Carbonaceous shale |

Source: D. Ozboda et al, Leonardite and Humified Organic Matter; G. Hoffman et al, Mine and Resources Canada (1993), Alberta Research Council, Canada.

HIGH QUALITY – LOW COST

HOW IT WORKS

DRY HOGh™ improves the chemical function, biological diversity and physical structure of soil. It binds with soil nutrients to hold them in the root zone. This decreases the downward mobility of nutrients through the soil, which increases nutrient availability to plant roots.

DRY HOGh™ is well-suited for many industries:

Agriculture, Golf Course, Nursery and many more.

SUGGESTED APPLICATION RATES:

- **Agriculture:** 100-200 lbs/acre annually
- **Fairways:** 100 lbs/acre annually
- **Tees & Greens:** 2 lbs/1000 sq ft annually



**CDFA Registered
Organic Input Material**

Benefits of Using DRY HOGh™

PHYSICAL BENEFITS

- Improves soil structure for better aeration and water movement
 - Sandy soils:** prevents water and nutrient loss
 - Heavy/clay soils:** reduces compaction; improves aeration and water movement
- Increases water-holding capacity of soil
- Improves germination and viability of seeds
- Adds carbon to soil

CHEMICAL BENEFITS

- Enhances nitrogen uptake
- Increases sodium tolerance of plants
- Retains water-soluble inorganic fertilizers in the root zone (reduces leaching)
- Chelates micro- /macro-nutrients making them available for plant uptake
- Increases buffering properties of soil
- High cation-exchange capacity (CEC) enables greater nutrient retention/availability

BIOLOGICAL BENEFITS

- Stimulates growth of beneficial soil microorganisms
- Stimulates root growth (better nutrient uptake)
- Aids in photosynthesis, plant respiration and plant enzyme activity
- Stimulates plant growth by accelerating cell division

Humic acid content has been measured by two methods:

| CDFA Method | A&L Method |
|--|---|
| <p>The CDFA method is a <i>quantitative</i> analysis of humic acid. This method reports the acid-insoluble fraction of humic material. The analysis is reported on an "as received" basis (includes moisture). The result can be mathematically converted to a dry-matter basis report. The CDFA method is based on the operational definition of humic acid. This technique, however, only uses a portion of the methodology described by the International Humic Substances Society method, which analyzes both humic and fulvic acid fractions. The Standard Methods for Soil Analysis of the Soil Science Society of America, as stated by R.S. Swift in "Organic Matter Characterization," states that the IHSS method is broadly accepted and can be performed in most laboratories. The CDFA method is a compromise, because the fulvic fractions are completely ignored — the fulvic fraction is actually discarded during the process.</p> | <p>The A&L Western method is a <i>qualitative</i> analysis, designed to report all of the alkaline-soluble humic materials in a sample. It consistently reports a higher percentage of "humic acid" than the CDFA method. It cannot be converted to a "dry basis." The A&L Western method may mimic some of the industrial process used to extract humic matter from oxidized lignite. However, the base extraction method cannot discretely remove unwanted materials, nor can it prevent the extracted materials from recombining with free radicals or contaminants. Therefore, the A&L Western method more than likely includes non-humic materials as well as humic substances.</p> |

Source: Mayhew, Lawrence, "Humic Substances in Biological Agriculture," Acres, Jan-Feb 2004 • Vol. 34, No. 1 & 2.