

Crops/Soil

In Agriculture, the range of humic products includes dry granular products, liquid products and powders. Humic products are widely used as soil amendments and/or blended with fertilizers.

Granular products, which are made from mined and screened ores referred to as Humates, Leonardite or Oxidized Lignite, are effective if used as part of an overall agronomic program. Coated, prilled (pelletized) or combined products that contain Humic Products combined with other nutrients or inputs can be used as part of overall program intended to improve soil structure, tilth, water-holding capacity and nutrient-holding capacity when applied to most agricultural soils.

Private sector research of granular, coated, prilled or combined Humic Products suggests that the potential for enhancing fertilizer efficiency and nutrient uptake are possible when the humic products are blended with dry fertilizers. Although more research is needed, the potential for improving crop quality and yield as well as helping to reduce environmentally-problematic effluent is very promising.

There has been extensive research on liquid Humic Products, such as liquid humic acids and liquid fulvic acids that are typically applied in the row, either with seed or during the growing season and as foliar treatments. Powders, either soluble or suspendable, have the same applications as liquid products. Liquids and suspendable powders are typically blended with other nutrient inputs for best effect.

Product Group	Product	Application Method
Granular	Humate, Leonardite, Oxidized Lignite, Humalite Coated, prilled or combined products Blended fertilizers with humic products	Broadcast or in-row Broadcast or in-row Broadcast or in-row
Liquids	Liquid Humic Acids Liquid Fulvic Acids	In-row or foliar, with or without other inputs Foliar with nutrients
Powders	Soluble Humic or Fulvic Acids Suspendable Humic Substances	In-row or foliar In-row or foliar

Humic Products in Feed/Livestock

The unique properties of humic substances allows them to be a useful and multifaceted ingredient in animal feeds. Farmers and researches have been feeding and testing humic substances since the early 1930's.

Containing both complex carbons and minerals, humic substances are added to animal feeds around the world as a trace mineral source, anti-caking agent, non-nutritive carrier, or pH adjuster. The HPTA is currently working with state and federal feed regulators to better understand these substances and how they can be used safely in animal feeds.

Humic Products in Environmental Remediation

Humic substances are the major components of all natural organic matter found in soil and water. Commercial humic substances are used for the remediation of our precious environmental resources because of their ability to interact with all components of natural ecosystems. They enhance the detoxifying capacity of ecosystems through biostimulation of microbes and deactivation of toxins. In natural systems, humic substances interact with microbial communities, dissolved natural organic matter, clays, and minerals to inactivate and degrade human-made synthetic toxins (pesticides, polycyclic aromatic hydrocarbons, polychlorinated aliphatic hydrocarbons, petroleum) and deactivate toxic metals (arsenic, mercury, cadmium).

The interactions of humic substances with toxic pollutants mainly consist of absorption, binding, association, sequestration and entrapment of the toxic molecule by the massive humic molecules. The microbial degradation process of synthetic organic molecules may be further enhanced by catalytic effects and increased sensitivity of toxic hydrocarbons to breakdown by sunlight.

Humic Products in Landscape/Turfgrass

Humic products have been utilized for many years in turf and landscape applications as natural chelators, soil conditioners, and nutrient enhancers. Humic products are typically used in turf management to help retain soil moisture, stabilize nutrients, and to increase nutrient efficiency. Because of their effects on soil microbial activity, some of the indirect effects of humic substances are:

- Increase soil aeration
- Positive impact on soil structure
- Improved drainage

Humic substances are complex long chain carbon materials that interact with nutrients, soil colloids and microbes in the soil-plant root zone, called the rhizosphere. They primarily influence micronutrient interactions and soil health, which are essential to plant root development and plant health. The chemically active fractions of humic substances are called Humic and Fulvic acids.

Humic Products in Health/Science

Human Health

Humic substances have been used for health related purposes which include both external and internal applications. For example the study of mud baths used in balneotherapy has revealed the humic substances are a component of the healing muds. Other past external uses include peat bandages used by the Red Cross in 1918 and also World War I, it was stated that the bandages “. . . proved to be of special value owing to their antiseptic qualities.” In more recent times cosmetic companies have included humic extracts in lotions, makeup, balms, and skin creams.

In addition to external use, humic extracts have been consumed internally for human health reasons. Modern research indicates possible antiviral and healing properties that are currently being tested.