



**TECHNICAL DATA
ADDENDUMS AND CASE HISTORIES**

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TECHNICAL DATA MICRONIZED HUMATE

ANASAZI GOLD, LLC

89-96% Humic plus fulvic acid content

High Grade Humate Oxidized Lignite (leonardite)

100%

Particle density (average):

1.5 g/cc

Bulk density

0.6 - 0.8 g/cc

Moisture

5 - 8 %

pH

7.0 to 7.8.

Particle size distribution

100% less than 150 microns

99% less than 60 microns

90% less than 35 microns

Avg. particle size 15 microns

10% less than 3 microns

All components are naturally-occurring materials

TOXICITY **Non-Toxic for Ingestion**
Non-Toxic dermal exposure

HAZARD **Inhalation of dust**
Possible irritant to lungs /eyes
Mask & eye protection advised when working with this material.

NUTRITIONAL VALUE AND TRACE MINERAL CONTENT

Mineral List and Base Elements

Antimony, Barium, Beryllium, Bismuth, Boron, Bromine, Calcium, Carbon, Cerium, Cesium, Chloride, Chromium, Cobalt, Copper, Dysprosium, Erbium, Europium, Gadolinium, Gallium, Gold, Germanium, Hafnium, Holmium, Indium, Iodine, Iridium, Iron, Lithium, Lutetium, Lanthanum, Niacin, Nickel, Magnesium, Molybdenum, Niobium, Osmium, Neodymium, Palladium, Phosphorus Potassium, Rhenium, Rhodium, Rubidium, Ruthenium, Samarium, Scandium, Selenium, Silicon, Silver, Sodium, Strontium, Sulfur Tantalum, Thallium, Thorium, Tellurium, Terbium, Thulium, Tin, Titanium, Tungsten, Vanadium, Ytterbium, Yttrium, Zinc, Zirconium

Amino Acids

Alanine, Glutamic Acid, Glycine, Histidine, Isoleucine, Leucine, Methionine, Phenylalanine, Serinine, Threonine, Triptophan, Valine

Considered Natures Best Chelator, Chelation is the ability to break the bonds of inorganic matter (heavy metals, pollutants, chemical toxins, drugs, hormones, pesticides, and radioactive material); changing it to organic matter so the body or soil can eliminate from its system. It is the breakdown and absorption of minerals, nutrients and amino acids. This natural process helps plants; animals and humans absorb minerals, nutrients, enzymes and amino acids.

Cells have the ability to accept or reject minerals, such as aluminum, lead, arsenic, or mercury, at their discretion when presented as organic, dissolved and complexed substances. When metals, minerals and trace elements become complexed into Fulvic, they take on an entirely new property of availability, unlike their original form. Many organic minerals are not used to “nourish” cells, but instead, are needed to act as electrodes in the fulvic electrolyte solution. In that capacity they are most essential for bio-reactions, electron transfer, catalytic reactions and transmutations. Without them you may be missing many of the bio-reactions they enable. Fulvic has the ability to complex and remove toxic metals and other toxins from the body. Fulvic mineral solutions have been ingested by people since the beginning of mankind, yet have never been shown to cause toxic mineral build up in humans or animals because they are organic.

The FDA has not evaluated these statements. This product is not intended to diagnose, cure or prevent any disease.

REPORT NUMBER

03-111-003

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CUSTOMER

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 TAOS, NM 87571

SAMPLES
 SUBMITTED
 BY:

MICHAEL KARR

TE OF REPORT

04/30/2003 PAGE

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FERTILIZER AND LIME ANALYSIS REPORT

SAMPLE IDENTIFICATION	Lab No.	Nitrogen % N	Total Phosphate P2O5	Potash % K2O	Sulfur % S	Zinc % Zn	Available Phosphate % P2O5	Non-Ortho Phosphate % of Total P2O5	Sulfate Sulfur	Calcium % Ca	Mg medium % Mg	Calcium Carbonate Equiv. % CaCO3	HUMIC ACID	HUMIC ACID
1DAN HUMATE PLUS HUMATE	24769	36.0	4.0	1.0									93.19	
	24770	36.0	4.0	1.0									96.56	

* Humic acid analyzed by CofA method.

This report applies to the sample(s) listed. Sample 119 retained a maximum of thirty days after testing.
A & L AGRICULTURAL LABORATORIES, INC.
 ROBERT BUTLER

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ADDENDUMS AND CASE HISTORIES

ADDENDUM A

Process and Product Definitions

Chelation

Chelation is the ability to break the bonds of inorganic matter (heavy metals, pollutants, chemical toxins, drugs, hormones, pesticides, and radioactive material); changing it to organic matter so the body/soil can get rid of it. It is the breakdown and absorption of minerals, nutrients and/or amino acids. This natural process helps plants; animals and humans absorb minerals, nutrients, enzymes and/or amino acids.

Humate

(Oxidized lignite) is a prehistoric pond on the verge of turning to coal but is not coal, and which still contains its bioavailability from the era from which it was derived. After deep underground shelves shifted 75 million years ago, this humate was discovered under layers of dirt, stone, and clay covering a lush prehistoric lake, which sealed unleached minerals, amino acids, and enzyme complexes watertight into near pure deposits. Generically it is the term given to all humic substances.

Humic Acid

Humic Acid is a long chain molecule, which is high in molecular weight, dark brown and is soluble in an alkali solution. When present in the body, it acts as a virus destroyer by preventing invading viruses from attaching to healthy cells. Specifically, humic acid is believed to have antioxidant properties and to support acquisition of free radicals. In soil, this is the portion of the soil responsible for composting and transfers the nutrient from the soil to the living organism. This material accompanies the nutrient into the organism and performs many benefits.

Fulvic Acid

Fulvic Acid is a short chain molecule, which has a low molecular weight, yellow in color and soluble in both acid and alkali. It is the world's finest electrolyte that can balance and energize biological properties. This is the portion of the soil responsible for chelating (grabbing hold of metals) minerals and transferring them to the living organism. Fulvic acid is unique in its chelation ability as it captures life essential minerals and places an electrical charge on them for ready uptake by the organism. Toxic metals are also chelated, but are neutrally charged and have difficulty in entering a living organism. Fulvic acids also act to detoxify the body of those heavy metals that may enter it.

Humin

Humin is that portion of the soil that is non-soluble. It is a dark brown material, with extremely high molecular weight and is responsible for the soils water holding capability, crumble and electrostatic conductivity.

Humic Substance

Humic substance is the portion of the soil that has been created by millions of years of decaying organic matter.

Safety

Humate is a safe material and exists in all soils, plants and animals. It is natural to the food chain and plays a role in the composting of dead matter into nutrients, and the transfer of minerals and other roles within the living organism. Many technical papers attest to humate's safety. Scientist at the Dnepropetrovich Agricultural Institute in Moscow revealed humate harmless with respect to blood, cardio-vascular system, endocrine system and other vitally important organs using patho-histological and histo-chemical methods. Humate does not cause allergic reactions, anaphylaxis (unexpected reactions) to other medicines; it is an apyrogen. Humate does not have embryo-toxic properties. The toxicity of naturally occurring humic acid is remarkably low ⁽¹¹⁾. The level of toxicity on an LD-50 test of 0.536 grams per kilogram can be considered as a conformation of the harmlessness of humate ⁽¹⁵⁾. Current repeat toxicity studies presented by Laub Biochem indicated total safety at levels up to 50 mg/kg of body weight ⁽²⁸⁾. Introduction of humates into the feed ration of chickens has reduced unspecific deaths 3 to 5% ⁽¹⁴⁾. Humates being fed to dairy cattle have shown no change in milk chemistry ⁽²⁶⁾. Broadly speaking, concentrations in the range of 50-2000 part per million (ppm) are usually effective, yet are not cytotoxic ⁽¹¹⁾.

Nutrition Value

Nutritional analyses ⁽²⁷⁾ vary with the differing humates. Those humates used in the case studies at the end of this paper contained the following % By Wt (PPM):

Protein 7.10

Ash 8.33

Fibre 12.50

Carbohydrates 51.20

Nitrogen 1.14

Moisture 8.60

Ammonia 1.38

Humic Acid 42 to 48%

Fulvic Acid 12% of Humic Acid Values

Trace Minerals (PPM) in Chelated Form

Aluminum 10 Chlorine 8.0 Hafnium 0.9 Molybdenum 0.9 Rubidium 4.0 Terbium 1.0
Antimony 0.3 Chromium 0.3 Holmium 0.5 Neodymium 10 Ruthenium 0.5 Thallium 5.0
Arsenic 0.8 Cobalt 0.9 Indium 0.5 Nickel 2.0 Samarium 0.9 Thorium 5.0
Barium 0.5 Copper 4.0 Iodine 0.1 Niobium 1.0 Scandium 0.9 Thulium 0.5
Beryllium 0.1 Dysprosium 0.9 Iridium 0.9 Osmium 1.0 Selenium 1.0 Tin 0.3
Bismuth 0.5 Erbium 0.8 Iron 1000 Palladium 0.5 Silicon 60 Titanium 0.1
Boron 0.8 Europium 0.9 Lanthanum 1.0 Phosphorus 30 Silver 0.2 Tungsten 5.0
Bromine 0.2 Fluorine 5.0 Lead 0.6 Platinum 0.5 Sodium 300 Vanadium 0.5
Cadmium 4.2 Gadolinium 0.5 Lithium 16 Potassium 1000 Strontium 4.0 Ytterbium 0.1
Calcium 300 Gallium 1.0 Lutetium 0.1 Praseodymium 10 Sulfur 2000 Yttrium 0.1
Cerium 4.2 Germanium 0.5 Manganese 34 Rhenium 0.5 Tantalum 0.6 Zinc 8.0
Cesium 4.2 Gold 0.1 Magnesium 2000 Rhodium 0.5 Tellurium 5.0 Zirconium 1.0

Scientist have found that high quality humic and fulvic acid preparations proven very safe for human internal and external uses. Anasazi Gold, LLC Humic Acid content is 96 % unmatched!

(Anasazi Gold, LLC's Laboratory tests are 96% humic acid for our human Consumable and 88% humic acid levels for our agricultural products.

Complexed Fulvic Minerals are not Toxic Heavy Metals

Cells have the ability to accept or reject minerals, such as aluminum, lead, arsenic, or mercury, at their discretion when presented as organic, dissolved and complexed substances. When metals, minerals and trace elements become complexed into Fulvic, they take on an entirely new property of availability, unlike their

original form. Many organic minerals are not used to “nourish” cells, but instead, are needed to act as electrodes in the fulvic electrolyte solution. In that capacity they are most essential for bio-reactions, electron transfer, catalytic reactions and transmutations. Without them you may be missing many of the bio-reactions they enable. Vital-Earth’s Fulvic Mineral Complex contains 68 to 74 complexed minerals in trace amounts, and should not be confused with metallic minerals. Fulvic Mineral Complex has a balanced pH on the alkaline side, ranging from 7.0 to 7.8.

Fulvic has the ability to complex and remove toxic metals and other toxins from the body. Fulvic mineral solutions have been ingested by people since the beginning of mankind, yet have never been shown to cause toxic mineral build up in humans or animals because they are organic. It is when Fulvic is *not* present that one should seriously worry about toxic buildup from any source. The lack of Fulvic in our lives could account for the health problems that are causing concern today in our “Fulvic starved” society.

Supercharged Electrolyte, Active Free Radical Scavenger and Antioxidant

It has been said that cellular electrical energy is the life force of the body. Cells disintegrate and die when electrical energy is reduced. It is believed that electrical and chemical balances within the cell can be created and controlled by electrolytes, the body’s mini battery chargers. Scientists tell us Fulvic is one of the most powerful natural electrolytes known to man. The supercharged Fulvic molecules balance cellular life restoring the electrical potential that was once normal to the cell by charging, regenerating, regulating and delivering their living energies to the living cells. Fulvic maintains the ideal environment for dissolved mineral complexes, elements and cells to bio-react electrically with one another causing electron transfer, catalytic reactions and transmutations into new minerals. It helps with human enzyme production, hormone structures, and is necessary for the utilization of vitamins. It has been found necessary for metabolic processes. It is also one of the most powerful natural antioxidants and free radical scavengers known. It has the unique ability to react with both negatively and positively charged unpaired electrons and render free radicals harmless. It can either alter them into new usable compounds or eliminate them as waste. Fulvic can similarly scavenge heavy metals and detoxify pollutants.

Fulvic Mineral Complexes are Better than True Colloidal Minerals

True colloidal minerals by themselves are not readily usable by cells. It is the Fulvic *in conjunction* with minerals that makes them effective. Many colloidal minerals on the market contain a small amount of Fulvic, which is responsible for any results they may produce. Vital-Earth’s Fulvic Mineral Complex is 100% Fulvic in solution that contains 68 to 74 naturally occurring, plant derived minerals and trace elements. Amino Acids, when properly nourished, show that individual cells are capable of producing many of their own amino acids, enzymes and other factors necessary for all metabolic processes. Each cell burns its own energy, maintains itself, manufactures its own enzymes, creates its own proteins and duplicates itself. It is essential to understand that the total metabolism of the body is the sum of the metabolic operations carried on in each individual cell. Humans can produce all but eight amino acids within their cells. Fulvic Mineral Complex promotes the natural production of amino acids within the body.

Growth and Maintenance Nutrients

Scientists have identified at least 90 growth and maintenance nutrients, which must be continuously supplied to sustain life. If we fail to supply adequate Fulvic nutrients, the cell will experience a breakdown. When the breakdown is substantial we have the onset of disease.

Human Health Values

Blood Properties

It has been found that humic acid in dose levels of 100-300 milligrams per kilogram body weight has no effect on bleeding time, clotting time, thrombin time, plate count, or induced platelet aggregation⁽⁴⁹⁾. Red blood cells and hemoglobin stay on normal levels under the influence of humate in comparison with control groups⁽¹⁵⁾. Literature has indicated that the red blood cells have the capability of carrying higher percentages of oxygen when in the presence of humate. Human subjects taking humate have reported feelings of euphoria, similar to

hyperventilating, during the first few days of taking humate. This euphoria is a result of additional oxygen. Healing of injuries, as a result of additional oxygen, is much quicker. Cutting horses have ankle inflammations frequently from their rigorous training programs and healing times for these injuries have been reduced by the usage of humates.

Mineral Transfer

Humates contain both humic and fulvic acids. The fulvic acid is the chelator that carries the minerals. The humic acid acts as dilator increasing the cell wall permeability. This increased permeability allows an easier transfer of minerals from the blood to the bone and cells. Testing on cows has indicated an increase of 16% more calcium ⁽⁴⁸⁾. It has been shown that incubation of cultured human umbilical vein endothelial cells with natural or synthetic humic acid results in an enhanced surface expression of tissue factor activity. There are also changes in intracellular divalent calcium levels ⁽¹⁾. Literature reports additional transport of iodine from foods into the thyroid glands ⁽²⁾. Just as fulvic acid carries life-sustaining minerals to the body, it also captures and removes toxic metals from the body. Detoxification takes place within first three to four days of usage. It has been reported that both humans and animals show looseness of bowels due to detoxification during this period and return to more solid evacuations after the third to fourth day.

Stress Management

Literature has reported that humates block or reduce the production of stress causing hormones. This has been observed in animal behavior, in particular with show calves first entering the arena. Animals on humate are less affected by the outside stimulus of the crowds or confining areas of the arena. This effect has been noted on sheep, horses, cattle and hogs. In dairy operations, those animals not on humate aggressively eat their feed rations while humate animals leisurely graze. Laboratory testing at Penn State physically restrained rats by binding them to artificially create stress and measured hormones known to cause stress. Those rats fed humate showed significantly less amounts of those hormones.

Cell Mutation

Humates within the body work with DNA and cellular division. It has been noted that the humate tends to prevent cellular mutation during reproduction. Several technical papers were noted during literature research for this paper regarding cancer research with humates. Natural humic acid administered as a prophylactic to rats can decrease significantly the amount of gastric mucus damage induced with ethanol. Humic acid also significantly accelerated the healing process of experimentally induced ulcers ⁽⁵²⁾.

Microbial Interaction

Humates are known to stimulate microbial activity. In soil testing for microbial activity, levels increased 400 to 5000 times with the introduction of humate (300 ppm) into the soil. Humates added to feed rations stimulate the microbial growth and the extent can be quite large depending upon the species, the culture medium, and the environment ⁽⁴⁵⁾. Humic substances have been also known to exhibit anti-microbial properties. Species for which natural humic substances have been shown to be inhibitory include *C. albican*, *Ent. Cloacac*, *Prot. Vulgaris*, *Ps. Aeruginosa*, *S. typhimurium*, *St. aureus*, *St. epidermidis*, and *Str pyogenes* ⁽¹²⁾. It seems that within the body, humates stimulate the "good" microbes while suppressing the "bad" microbes. Testing of milk during field trials indicated a large increase of microbes within the milk. This is usually an indication to the dairyman of impending mastitis (tit infection). The opposite actually happened. Mastitis cases within the milking herd dropped from an average of 3 to 4 cases daily to 4 cases in a month ⁽²⁶⁾. Additional conformation of reduction of mastitis was observed in lactating female goats. Three female goats with severe mastitis were administered doses of humate over a two-week period. At the end of 7 days, swelling of the mammary glands had subsided and the goats were back to normal activity allowing the kids to nurse without discomfort.

Immune System

Humates bolster the immune system. Dr. Daryl See, MD, Immunologist of UCLA Medical School suggests that the mechanism is related to the humates' ability to complex sugars within the body. The abundance of these complex sugars allows the body to manufacture glycoproteins that attach to the killer and T cell, acting as

a modulator or communication link between the cells. This regulates the immune system cells and prevents either the T or Killer cells from becoming out of balance. Excessive killer cells can attack bone and joints causing arthritis. Conversely, the presence of excessive T cells can cause autoimmune diseases. Along this same line, burn victims and those with radiation sickness experience immune system responses that attack the body's dead cells, thereby creating unwanted infections. Humates cause the immune system to recognize its own dead cells thereby reducing infection. Baylor Medical School is currently researching humates both topically applied and internally dosed for burn victims to reduce infections. Russian scientists are using the same principle for the treatment of radiation sickness. Sodium humate has been found to increase the lifespan of mongrel rats exposed to lethal doses of cobalt radiation ⁽⁸⁾.

Anti-inflammatory Properties

Humic acids isolated from peat exhibited significant efficacy for adhesions when tested on female rats that had standardized lesions placed on both uterine horns and the peritoneum of the anterior abdominal wall ⁽¹⁾. Humic substances, including peat and sodium humates, are known to exhibit anti-inflammatory properties ⁽⁴⁷⁾. Inflammatory states of the cervix, especially cervical erosion (generally known as cervicitis) can be treated with humic preparations ⁽⁴¹⁾. Not only does the humate relieve swelling from joint inflammation, it has been shown to bond to the collagen fibers to aid in repair of damaged tendons and bone. Tendon strength has been shown to increase by as much as 75% ⁽⁹⁾⁽⁴⁸⁾.

Anti-Viral Properties

Humates are effective media additives for the production of antibiotics in the soil ⁽⁴⁵⁾. Humic substances have long been known to exhibit antiviral properties ⁽⁴⁴⁾ in particular rhinoviruses ⁽³⁵⁾. Viral pathogens for which soil-extract materials have been shown to be effective include in particular Coxsackie virus A9 ⁽³⁴⁾, herpes simplex virus type 1 and 2 ^{(10), (11), (21), (29), (36), and (37)}, human immunodeficiency virus (HIV) ^{(22), (30), (31), (38), and (39)}, influenza type A and B ^{(22), (35), (38), and (40)}, as well as other respiratory tract infections. ^{(33), (34), (35), (37), and (41)}. The mechanism whereby humic substances inhibit the cytopathicity of a number of viruses has been studied in some depth. It is thought that the materials prevent viral replicating by absorbing onto the viral envelope protein and thereby blocking the absorption of viral particles to cell surfaces ⁽³¹⁾.

Humic acids have also been employed as veterinary medicine therapy successfully employing peat mull (extracted humic acid) to prevent the transmission of foot and mouth disease in pigs ⁽³³⁾. Humate is a pharmacy that raises non-specific organism resistance. This fact was confirmed by using such models as atoxic anemia, toxic hepatitis, peptic ulcer and hypercholesterolemia ⁽¹⁵⁾.

Liver Effects

The effect of natural humic acid on the regenerative response of liver tissue has been examined in rats submitted to two-thirds hepatectomy. Long-term application of humic acid resulted in the stimulation of ornithine decarboxylase, an increase in spermidine and histamine as well as DNA and RNA levels, and in overall liver mass ⁽⁵⁰⁾. Humic as well as fulvic acids extracted from peat have been shown to stimulate respiration in rat liver mitochondria when present at concentrations of 40-360 micrograms per ml. Humic substances at concentrations of 40-400 micrograms per ml. also increased the efficiency of oxidative phosphorylation in mitochondria in vitro, particularly after contact periods of over 1 hour ⁽⁵¹⁾.

A large part of the humate takes an active part in the liver metabolism. The use of humate plays a role in the liver function and protects it somewhat from disease and/or disturbances ⁽¹⁵⁾.

Detoxifying Properties

Fulvic acid, a component of humate, is a strong chelator. It is unique in its chelating ability. Life sustaining minerals, when chelated by fulvic, are placed in a chemical state (phyto-state) such that the cell or organism readily absorbs them. Toxic heavy metals are also chelated but placed in a chemical state that is difficult for cellular absorption. Fulvic acid in the soil acts as a filter for toxic metals. It will grab the toxic metal and immobilize it, which prevents it from migrating or chemically reacting. When crops are grown on soils deficient in fulvic acid, toxic metals can be absorbed by the plant and passed into the food chain. Many of our

foods present today are grown under conditions of "worn out" soil. As a result, more toxic metals are being ingested, and Fulvic acid has the capability of removing these toxic metals from the body.

Odor Reduction

Texas A&M University System researchers have discovered that using humate decreases volatile ammonia in animal waste by 64%, reduces odor, and improves the nitrogen to phosphorus ration in the waste. Scientists are developing ration formulations to enhance manure characteristics while maintaining animal performance as well as devising other approaches to maintain feedlot efficiency and to manage waste ⁽²⁵⁾.

Observations from field trials on dairy animals indicate a more complete digestion of feed as observed from the manure and urine. Manure from the humate test herd consisted of fine particle, low odor matter while control animals contained lumps of corn and straw and high ammonia odors. Urine from the test herd was clear and odorless while the control herd was amber with odor ⁽²⁵⁾. A similar effect has been observed on hogs.

Hydrogen Sulfide (H₂S) (rotten egg odor) has also been reduced by the addition of humate to the mix. Wagner Quarries Company has demonstrated reductions in H₂S by humate interaction. The mechanism is not fully understood, but results indicate good odor reduction ⁽²³⁾.

Miscellaneous Properties

Chemically (strophantinum) induced heart stoppage in frogs was examined. Frogs that were given humate continuously for 10 days prior to the drug increased the time of heart activity 48.7% in comparison with the control group. Additionally the protective property of the humate was revealed when toxic doses of strychnine (inhibits metabolism in the central nervous system) were administered to test mice. Those mice (70%) given humate 10 days prior to the treatment lived while 100% of the control died ⁽¹⁵⁾.

AGRICULTURAL VALUES

In 1936 the US Senate issued Document 264 with information regarding the minerals, or should it be said a lack of minerals in our food, and their relationship to good health. They recognized that many diseases stem from the impoverished soil in America that no longer provides plants with the mineral elements essential to human nourishment and health.

“Humates increase crop capacity in agriculture.” Make Plants Drought and Freeze Tolerant” Humates, Humic Acid and Fulvic Acid also increase nutrient uptake. While adding the 72 minerals and 13 amino acids and eliminate toxins and heavy metals.

The fertility of the soil was always related to its humus content. It was determined that humic substances participate in the regulation of most important characteristics. First of all, they are accountable for the coloring and, therefore, thermal conditions. It is particularly important for cold clay soil, which under the effect of humates becomes warmer. Secondly, long-term humate treatment is conducive to the improvement of soil structure. When humates enter the soil, they form potassium and magnesium humates that bond mechanical element of the soil and act as organic-mineral bridges between aggregates. Thirdly, one of the important qualities of humates is their ion-exchange activity. It ensures humates' ability to regulate the process of transformation of mineral nutrients in soil-plant system. Fourthly, humate treatment increases water saturation of soil. It is particularly important for sandy soils. Its water saturation ability increases by more than ten times after humate treatment. The same principal applies when preparations are used for melioration. Fifthly, the most important challenge of our times is restoration of the fertility of the soil in suburban zones of the industrially developed regions. Modern ecological overload makes the soil's natural self-rectification with microorganisms insufficient. Traditionally, organic fertilizers (manure, compost) were used to increase biological activity of the soil and to improve its self-rectification. However, in spite of high nutritious value of these products, their bond with organic mass is too close, and it decreases their assimilation. That is why these products are used in large quantities. Introduction of humic substances solves the problem very effectively.

Humic substances determine the structure and the fertility of the soil. They are an effective measure in solving ecological problems, such as pollution of soil and subsoil waters by chemicals used in agriculture.

Recent university and USDA studies show that today's fruits and vegetables are lacking in all 77 minerals and trace elements. Due to Chemical NPK farming (Nitrogen, Potassium and Phosphorous farming) and thousands of years of rain, soils are depleted of essential minerals and nutrients. Even with all of the medical advances of today, more and more people are dying of disease than a hundred years ago. Many health authorities are crediting this to mineral, amino acid and enzyme deficiencies, and often enough, many of the mineral supplements that offer these minerals are not found in a bio-available form. This results in a decreased absorption rate, making the minerals completely useless. Our humates (the ANASAZI GOLD LLC vein is from the Menifee formation, approximately 75 million years old, containing 72 trace minerals and 13 amino acids. An independent laboratory in Florida to contain 96% humic acid content has tested these trace minerals and amino acids. Other company's published humates test from 30% to 70% Fulvic acid content, with high heavy metal and arsenic levels. Our humate acid content does not contain these potentially harmful heavy metal and arsenic levels. Our humates activate and chelate the minerals, amino acids, enzymes, and trace elements from whatever is associated with them, and make them bio-available to living cells.

Animals

Observational reports from farmers using the humate in their feeding programs have reported additional weight gains and healthy livestock on beef cattle, hogs, chickens, emus and earthworms.

CASE HISTORIES

Beef Cattle

Dairy cattle being fed humates showed improved feed efficiencies. The control herd ate an average of 38 lbs. of feed daily while the test herd consumed 36 lbs. daily. Milk production for the test herd increased 1.9 lbs. per day per animal. Since milk production is a direct function of feed intake, the animal feed efficiency increased ⁽²⁶⁾.

Texas A&M, under the leadership of Dr. Chirase, performed humate feeding trials on steers at a feedlot in the Amarillo area. Reported results of the 56-day study indicated a 12% increase in feed efficiency. Manure samples were of a fine texture with reduced odor. Blood data indicated increases in hemoglobin and antioxidants ⁽⁵³⁾. Follow up testing on the odor indicated a 64% reduction in ammonia from the animal waste when humate was mixed into it ⁽²⁴⁾.

A farmer in Waco, Texas, mixed humates into the rations of a mature cow and three calves. Reports after 60 days indicated coloration and health of the animals to be excellent. Weight gain on the calves was reported to be way above the norm. Then humates were given directly to the herd, the cows and calves did seem to have more energy but not hyper, they were very calm and seemed more alert. Their hair was shiny and healthier looking. And weight gain was very noticeable in a very short time period. The cattleman did report something that was significant. He had a few cows that he had been trying to breed over a three-year period without success. During the testing period, the cows became pregnant.

Dairy Test

Canton, Texas. This test was run on 500 high producing dairy cattle over a 28-day period. Milk, blood and animal waste were analyzed before, during and after the testing period. The introduction of the humate into the diet produced 1.9 pounds of extra milk daily per animal. The feed consumption dropped from 38 lbs. per day to 36 lbs. per day during the test. At the conclusion of the test period, consumption returned to 38 lbs. With these changes in feed quantities, it can be concluded that the animal was digesting its nutrients more completely, thus creating greater milk production. Additionally the humates produced a calming effect on the animals, as exhibited by lowered aggressiveness in eating and reduced the effects of heat stresses produced by summer temperatures. Lactation decline curves flattened significantly during the testing period. This indicates that longer milking periods can be achieved raising the cumulative amounts of milk received from each cow. Odors from the animal wastes were reduced. Less volumes of manure and reductions in ammonia odor results in less waste and reduces the effects of potential insect born diseases ⁽²⁶⁾.

Goats

Sunset, Texas. Nursing female goats were experiencing mastitis (tit infection) and would not allow the kids to nurse. Humate was introduced into the ration and within one week all infection had cleared up. Brady, Texas. Angora goats are being fed humate to improve the quality of the wool. Reports from the wool buyers indicate that the humate fed goats have longer staple and more lanoline in the wool. Pricing on angora wool is based on quality.

Hogs

Dr. Matt Colvin, DMV reports that he is using humates in the diet to treat scours in piglets. His experience with the humates indicates that it is a very effective treatment. Additionally, he is reporting additional weight gain with meat that is lean with good textured and excellent taste. Reproduction from the humate fed sows is excellent and produces larger than normal piglets.

Rattan (Ostrich, Emus)

Clayton, New Mexico. A farmer raising ostrich has reported plumage development on young birds has been accelerated. Eggshell development is excellent and uniform. The yokes are reported to be firmer. A greater percentage of hatchings are being produced. The farmer also reported that hoof rotation has ceased to be a problem. Hoof rotation is a problem on long legged animals. It results when tendon and muscle grow faster than bone in young animal and results in a clubfoot. Prior to the humate, the farmer was experiencing about 5% of his young birds experiencing some degree of hoof rotation. Since the introduction of humate, bone growth has kept up with muscle grown and reduced hoof rotation problems to below 0.5%.

Waco, Texas. The farmer was raising emus. Since the market price on emus had fallen, he was allowing the flock to forage and supplementing with millet (a low cost feed). At the time the humates were introduced into the diet, the birds were in poor to fair shape. Hot summer temperatures had taken their toll on the birds and plumage and skin were in poor condition. Humate was fed over a 60-day period. The health of the birds greatly improved and plumage became excellent with bright coloring. Under hot dry conditions the females do not start the reproduction cycle until late fall when the summer heat breaks. The females in this flock started the reproduction cycle in mid September (still hot). The only way this can happen is for the bird to be in excellent health.

Chickens

Adding humate to the fodder of broiler chickens increases the yield mass on average of 5 to 7% ⁽¹⁴⁾ ⁽¹³⁾. Purcell, Oklahoma. Two pens (20 each) of newly hatched chicks were used for a test and control. The test birds were fed humate in the diet while the control was not. Feather development came earlier on the humate birds. The test group was fully feathered a full week ahead of the control group. Weight gain of the test group after 30 days amounted to 1.5 pound more mass than the control group. Of notice was the calming factor of the humate. One could enter the test pen and the birds continued with their normal pecking and wanderings while those in the control pen would become extremely excited and run with wildness. The test was continued onward for a period of six months. The mature birds were monitored for egg production. Eggs shells from the humate group were thicker and more uniform in size. Hatchling chicks from the test group were larger and more active.

Horses

Received a letter from cutting horse owner in Boyd, Texas. "I started using humate in my horses six years ago. I have found that even in the winter when the animal's hair is long and coarse, that my horses have a deep, rich, shining coat and bright eyes. They are very alert but not hyper. I haven't had a sick horse in years and their hooves grow well and hold a shoe extremely well. My horses overall health and performance, since I have been feeding the humate is excellent."

Willow Springs, Texas. Willow Springs is the site of a large training area for racing and cutting horses for the Dallas Fort Worth metroplex. The training regimen for these animals is quite intense. Front ankle injuries with swelling are quite common and require several weeks of inactivity to heal properly. This inactivity extends the

expensive training time. Several of the trainers tested the humates in their animals. They found that healing times for the ankle injuries were reduced by one to two weeks. In timing trials, the humate horses were performing better. It is not uncommon for a quarter horse on humate to be able to shed a few tenths of the second on his time. In quarter horse racing those few tenths can mean the difference between winning and losing.

Fort Worth, Texas. This horse was a successful registered western pleasure paint that suddenly came up with severe degenerating hooves. The attending Ferrier hadn't seen such a severe case in years. On all four hooves, there was insufficient nail to place a shoe. Humate was introduced into the ration. Hoof grow out was immediately outstanding, shoes were put on in about four to five months, and the horse was back in the show. The Ferrier was shocked at the improvement.

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