



# Case Studies & Technical Review

## SOIL ORGANIC MATTER

It has been widely acknowledged that the key to soil fertility is organic matter. Soil organic matter often contains many nutrients and trace elements that have been stripped from the soil through human activity. The use of chemical fertilizers, though capable of improving plant growth, is simply not sufficient in replenishing the structure and fertility of the soil. In general, the addition of organic material, and more specifically humic substances, has been shown to improve soil quality and productivity.

**FACT:** Soil organic matter impacts soil aggregation, tilth and soil water characteristics.

**FACT:** Soil water holding capacity, permeability, infiltration, and surface crusting are improved with the addition of organic matter to soil.

**FACT:** Soils high in organic matter tend to be more productive and more biologically active.

## HUMIC ACID IN SOIL

SHAC *REVITAGRO*<sup>TM</sup> is an excellent source of Humic Acid. Humates and humic acids act in many important ways to make soil more productive and fertile.

- Humates (metal complexes of humic acid) help to supply growing plants with food. They also act in other important ways to make soil more productive and fertile.
- Humic substances increase the water holding capacity of soil; therefore, helping plants resist drought.
- Humic substances help retain water soluble inorganic fertilizers, releasing them as needed to growing plants, and help prevent nutrient leaching (through chelation).
- Humic substances result in increased aeration of soil.
- Humates establish a desirable environment for microorganism development in the soil.
- Humic acids form stable complexes with metals (ex. chelation of salts), thereby limiting the effects of soil salinity and/or soil contamination.

## BENEFITS OF USING *REVITAGRO*<sup>TM</sup>

- Increases the organic material content of soil, resulting in improved soil structure (e.g. reduced compaction) and moisture retention.
- Increases the humate/humic acid content of soil, resulting in increased fertilizer retention and improved soil productivity.
- Limits the effects of drought.
- Limits effects of salinity in soils through chelation of excess salts.
- Environmentally friendly and safe to use.

## HOW *REVITAGRO*<sup>TM</sup> WORKS

SHAC *REVITAGRO*<sup>TM</sup> has been developed as a soil conditioner for the purpose of improving the physical condition of plants and soil, increasing fertilizer retention, and controlling salinity. The raw materials in SHAC products are acquired from one of the highest quality humate sources in the world. In addition to containing an excellent source of organic matter and humic acids, *REVITAGRO*<sup>TM</sup> contains a variety of essential trace minerals. Most chemical fertilizers contain only Nitrogen, Phosphorus and Potassium. *REVITAGRO*<sup>TM</sup> contains essential trace minerals which are necessary for both plants and beneficial microbial populations.

### ADSORPTION • ION EXCHANGE & CHELATION • MICROBIAL STIMULATION

Humic complexes adsorb various contaminants and toxins, thereby reducing the bioavailability of these detrimental compounds in soil environments. The high cation exchange capacity associated with humic products aids in improved micronutrient exchange between plants and soil. Humic molecules are also known to 'chelate' heavy metals and excess nutrients present in the environment, thereby reducing the negative effects of certain metals while improving the retention of valuable nutrients within the soil column.



## RESULTS

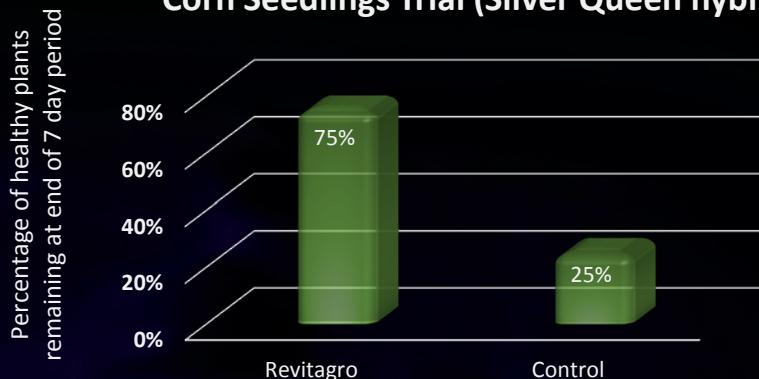
SHAC Revitagro™ has been developed as a soil amendment and growth aid for all types of soil, turf/lawn and foliar applications. The product contains a high-quality source of humic/fulvic acids, which are known to improve soil conditions, as well as improve nutrient uptake, viability and drought resistance in plants. The product has also been found to improve fertilizer retention and reduce the effects of salinity in salt affected soils.

### DROUGHT RESISTANCE

In a trial conducted on corn seedlings, Revitagro™ was applied on a foliar basis to drought-stressed corn shoots and observed for a period of seven days. The following results were observed:

- Only 25% of the untreated shoots had maintained a healthy appearance.
- 75% of the Revitagro™ treated shoots remained healthy in appearance at the end of the observation period.

### Plant survival following drought stress - Corn Seedlings Trial (Silver Queen hybrid)



### FERTILIZER / NUTRIENT RETENTION

A sandy loam soil was treated with Revitagro™ in order to examine the effects of the product on fertilizer retention. In this particular soil sample, only Nitrate-N and Sulphate-S were present at levels considered 'very low'. Phosphorus was present at 'low' level, and Potassium level was 'very high' and therefore, not reported in the results below (pre-treatment levels were highly elevated). Following Revitagro™ treatment, it was found that fertilizer retention was related directly to pre-treatment levels of nutrients present in the soil. The following improvements to nutrient retention were observed:

- 31% improvement in Nitrate-N
- 11% improvement in Phosphorus
- 27% improvement in Sulphate-S

### Increases in Fertilizer Retention due to SHAC Revitagro™ Treatment (%)

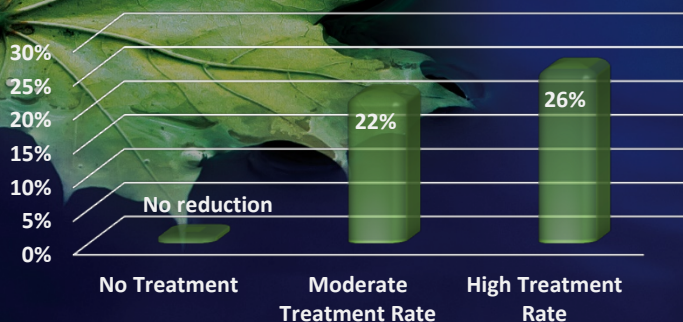


### SALINITY

Revitagro™ was applied in three separate trial sets to determine the effects of the product on salt-affected soils. Electrical conductivity (EC) was used as the measure of salinity in these trials. The following results were observed:

- At moderate treatment rates, EC values in saline soil decreased by 22% over a period of 1 month.
- At high treatment rates, EC values decreased by up to 26% on an immediate basis.

### Salinity Reduction (%) with Revitagro™ Treatment



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1-888-533-4446 or visit us at [www.shac.ca](http://www.shac.ca)**