

Throughout much of the world, salt is used to melt snow and ice on roadways, sidewalks, concourses, etc. Although salt is an effective, low cost solution, it can be damaging to plants, trees and grass, resulting in sick and dead landscape along roads and thoroughfares. It can be costly for government and private organizations to repair and replace this landscape and there are very few low cost prevention techniques. Floris™ and NutraHume™ are materials that were tested and proven to reduce the adverse effects of salt on plant material of any kind.

In 1998, an extensive study was sponsored by the government and conducted in Moscow, Russia by the Moscow Engineering and Landscaping Company to develop and test ways to eliminate the adverse effects of salt on landscaping along roadways. Throughout the city, an estimated 100,000 trees died annually due to salt toxicity from road salting.



Pictures 1, 2: Trees planted along roads and contaminated by salt, salt run-off, and salty overspray.

In the spring, several test areas were identified along busy roadways and intersections with younger trees. None of these trees showed signs of budding and/or leaf formation (see Pictures 1 and 2). The soil was tested and found to have high levels of salt. In May, some of the trees were treated and others (control) were left untreated. Treatment consisted of three (3) treatments of Floris™, diluted in ratio 1:1200, every 14 days. The dilution was simply watered into the base of the trees and bushes.

During the treatment process, the treated trees started to leaf-out (see Picture 3). During the same period of time, the untreated trees did not show signs of leaf-out and it was detected after the treatment period (42 days) that they were dead (see picture 4).



Picture 3: Treated trees during treatment period.



Picture 4: Untreated trees during the treatment period.

It was noted that some of the treated trees, although they recovered, had some damage at the tops and within the body of the tree (see Picture 5). It is believed that this was due to salty overspray from vehicles once the snow melted from the salt.

Floris™ is a chemically, biologically and geologically active material. In the soil Floris™ adsorbs and coordinates sodium cations and chlorine anions resulting less toxicity. At the same time Floris™ makes excessive amounts of salt more mobile in terms of sodium cations and chloride anions ability to leave the soil resulting in soil desalination and salt toxicity reduction/ elimination. Floris™ catalyzes toxic organic and mineral pollutants decomposition into neutral compounds. Floris™ catalyzes the processes of new soil organic matter formation resulting in stable Humus formation which improves the soil's properties and functions. Floris™ also catalyzes the process of new soil mineral

formation resulting in sodium, chlorine, etc. cation and anion conversion into physically and mechanically bound status, thus eliminating salt toxicity. These processes generally require long periods of time, but Floris™ accomplishes these results in short time periods, often detectable in weeks.

In addition to salt damage, Floris™ has been shown to support recovery of trees damaged by frost, insects, fungal, bacterial and viral diseases, and drought. Floris™ works by increasing the rate of metabolism in the plants on the cellular level resulting in more sugars; starch other carbohydrates formation as well as vitamins and other biologically active substances formation. Floris™ keeps the plant's cell and other structural units more watered. At the same time, Floris™ protects plants on the cellular level from absorption of toxic and harmful compounds including salt, and stimulates the plants growth and development.



Picture 5: Treated trees with salty overspray damage.

The study above was conducted using Floris™. However, NutraHume™, a new, non-cationic Active Humic Compound, will provide all of the benefits of Floris, with the added benefit of specially formulated buffered nitrogen.

NutraHume™ has many benefits depending on the application including

- Soil
  - Increased fertilizer utilization (slow release resulting in less leaching)
  - Converts clay and sandy soil to aggregated soil type
  - Increased soil water holding capacity
  - Increased bio-activity from native microbes and suppressed pathogens
  - Reduced soil compaction

- Plants
  - Reduced salt toxicity impact
  - Increased nitrogen through foliar spray without leaf burn
  - Higher crop yields
  - Increased sugar, starch, oil and protein
  - Increased stability under drought and freeze conditions
- Water
  - Reduced salt toxicity in irrigation water
  - Binds heavy metals
  - Keeps the pH under control and stimulates bicarbonates conversion to organic matter
- Industrial Waste
  - Binds and absorbs PCB's and PAH's and stimulates their bio-chemical decomposition/ neutralization
  - Binds heavy metals