

## The Influence of Humic Substances on Soil Health, Water and Fertilizer-Use Efficiency

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In Elmore County, Idaho, research trials have been established since 1994 to evaluate the benefits of humate products (liquid carbon) on cropping systems. All OM added to the soil significantly benefits soil functions, the largest being the retention of nutrients. Data from humic acid (HA) has been collected over a three-year period.

The trials have shown that different cropping systems responded differently to different products in relation to yield and quality. Research has shown adding HS to the soil will reduce nutrient loss, hold more of the biomass' carbon, prevent chemical leaching, and improve water-holding capacity which, in turn, preserves our water resources, playing an important role in the determination of aggregate stability.

Humates can increase phosphorus availability by complexing ions into stable compounds, allowing the phosphorus ion to remain exchangeable for plants' uptake. Collectively, the consistent use of good quality products in our replicated research plots in different years continued to result in a yield increase from 11.4 percent to the maximum of 22.3 percent. Our experimentation with these commercial products is consistently showing an increase in the yield and quality of crops.