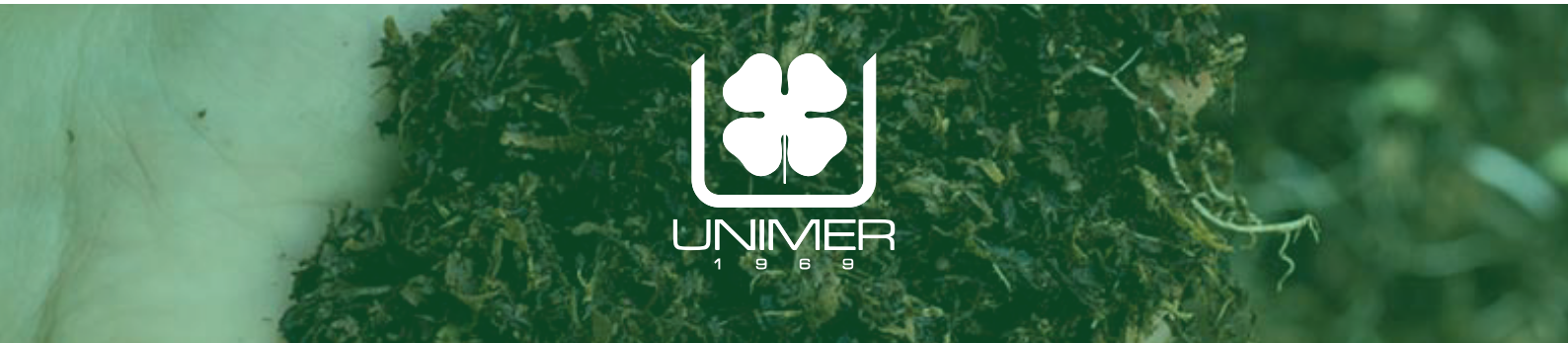
THE KEY ROLE OF ORGANIC MATTER IN MODERN AGRICULTURE

Modern agriculture should consider the use of humified organic matter in all fertilization plans, given its fundamental role in restoring and maintaining a good level of soil fertility, allowing the revitalization of humification processes and contributing to environmental sustainability. In fact, the production capacity of food depends on the soil and therefore strategies must be urgently implemented to maintain its fertility to meet the food demand of the growing world population.

The soil

In agriculture, the soil represents a resource to be preserved because it is limited and difficult to renew: it is necessary to maintain a high level of fertility, through the reintegration of the annual losses of **humified organic matter**, caused by the intensification and specialization of modern agriculture, as well as to climate change and loss of biodiversity.

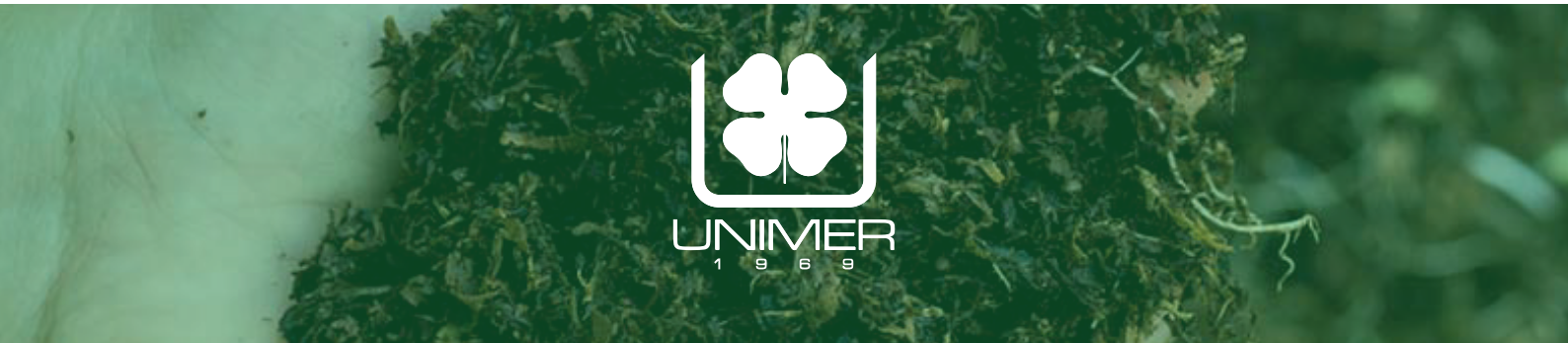
Sustainable development goals depend on the availability of healthy soils and sustainable land use. More than 95% of food production depends on the soil and over 90% of the planet's biodiversity in terms of living organisms is found in the soil. These two elements are sufficient to determine the strategic value of the soil resource.



The soil can be considered as a living "organism" that consumes and transforms energy, especially thanks to its microbiological component. One cubic centimeter of soil contains billions of microorganisms that feed on organic matter. Among these there are some indifferent, others pathogens and others still useful for the development of the plant. A good content of humified organic matter in the soil tends to shift the balance towards the latter, greatly improving the conditions for the growth and development of plants. Some of these, such as mycorrhizal fungi, establish a symbiotic relationship with the plant, helping it to obtain water and nutrients. Other fungi and bacteria, that develop especially in the rhizosphere, the soil area immediately next to the roots, positively modify the physical-chemical environment, stimulating root growth, improving the solubilization of nutrients, protecting the plant from attacks by pathogenic organisms and reinforcing its defenses. They also produce biostimulating factors that positively influence plant physiology and metabolism. This is the reason why the soil cannot be considered as a simple support for the roots, where the water and nutrients necessary for plant growth circulate.

The organic matter

The humified organic matter plays an important role in improving the availability of nutrients for the plant and in maintaining a high level of microbiological activity for the development of a microbiome able to counteract the phenomena of soil fatigue.
Agronomically, organic matter is defined as the whole complex of life forms present in the soil and the matter formed by their decomposition. The most important fraction of the organic substance is **humus**, resulting from long and complex microbial transformations that lead to the formation of carbon-rich very stable substances, which do not quickly transform into mineral nutrients, but which play a very important role in the soil and for the plant. Humus is mainly composed of humic substances: **humic acids, fulvic acids and humins**. Humic substances condition soil fertility, with positive effects on its physical, chemical and biological characteristics. A soil well-endowed with humified organic substance favors an optimal environment for plant growth. The benefits of **humified organic matter** include:
- improvement of the soil structure with greater aggregation of mineral particles, allowing better air circulation;
- increase in water retention capacity but, at the same time, improvement in draining capacity which reduces the negative effects related to excess water;
- limitation of the phenomena of insolubilization and loss by leaching of nutrients;
- improvement of the ability to exchange and absorb nutrients in the soil-water-root system.

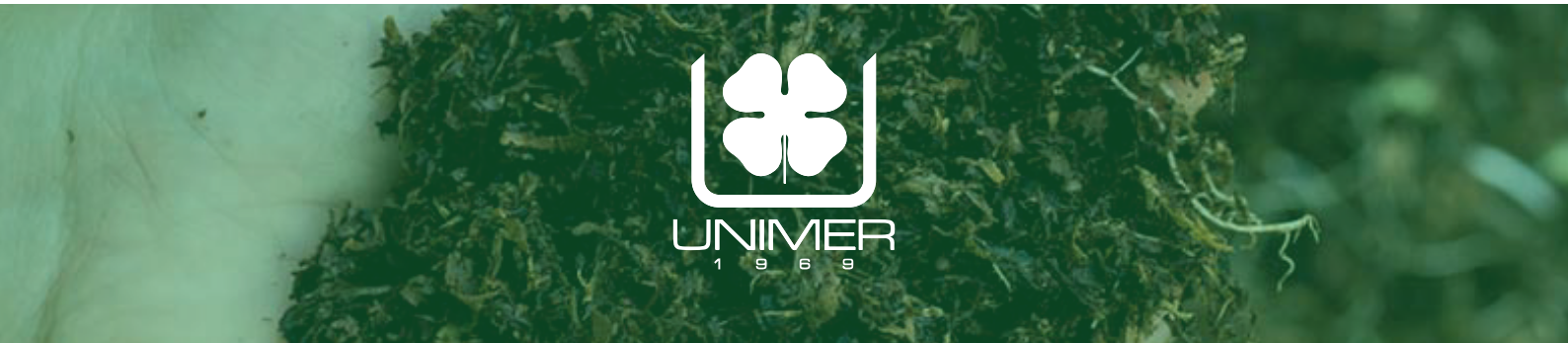


Humic substances also have direct effects on plant physiology and metabolism due to their hormone-like activities. In particular:
- improve the growth of the root system by stimulating the elongation of the roots;
- increase the number of root nodes ensuring greater branching of the root system;
- have systemic effects that positively affect the balanced growth of the plant and on flowering, fruit setting and ripening;
- improve the plant's resistance to abiotic stresses.

Until the beginning of the twentieth century, the most used fertilizer in agriculture was mature manure, which was able to counteract the slow consumption of humified organic substance accumulated in the soil; with modern agriculture, the consumption of organic matter in the soil has significantly increased. The deep and frequent processing, the adoption of irrigation and the same mineral fertilization, techniques necessary to obtain quantitatively and qualitatively high productions, have increased the speed of mineralization of the organic substance and its decay in the soil. In many areas the content of organic matter is below the sufficiency threshold and there are critical deficiencies that have a negative impact on fertility and ability to react to the extreme climatic phenomena. Consequently, considering fertilization a simple technique of reintegrating the nutrients removed from the plant is an outdated practice.

The mitigation of the effects of climate change

Agricultural activities depend on weather conditions and climatic events linked to the warming of the earth add elements of further risk. An increase of 2°C compared to the temperature of the pre-industrial era is considered by scientists as the threshold beyond which there is a risk of dangerous and potentially catastrophic environmental changes occurring. For this reason, the international community has recognized the need not to exceed this threshold. Possible short and medium-term adaptive solutions to climate change should include:
- adjust the timing of agricultural operations, such as planting or sowing dates and the application of fertilizers;
- choose crops and varieties that are better adapted to the growing season, to the availability of water, more resistant to the new conditions of temperature and humidity;
- intensify the use of weather forecasts in the medium term and use water more efficiently;
- improve soil management practices **by increasing the contribution of organic matter to retain moisture.**



Considering the Italian agricultural reality, many areas are now below what is considered the threshold of sufficiency of the organic substance content in the soil. In particular, in southern Italy there are critical deficiency situations that have a particularly negative impact on the fertility of the soils and their ability to react to the extreme climatic phenomena.

To limit the continuous loss of humified organic matter in the soil, the use of **high-quality humidified soil improvers** is essential.

UNIMER has been producing soil improvers, organic and organo-mineral fertilizers answering the sustainability and profitability needs of modern agriculture for over 50 years. The range of UNIMER soil improvers includes: SUPERSTALLATICO, MICROLIFE and GREENPOWER.

SUPERSTALLATICO is produced exclusively with bovine and equine manure from non-industrial farms which, subjected to a long maturation process, reaches a high degree of humification.

MICROLIFE is a highly humified bovine and equine manure-based soil improver, added with a selected microbial consortium of rhizosphere fungi and bacteria that helps to restore a favorable microbiological balance in the soil.

GREEN POWER is a 100% vegetable soil improver, rich in humic, fulvic acids and humins, for use when it is preferred to avoid soil improvers of animal origin.

All UNIMER soil improvers are certified for **organic farming**.
UNIMER pays particular attention to the formulation of its products which come in the form of **minipellets**, compact and of small and regular dimensions, **particularly suitable for mechanized distribution**. Also the **sanitization process in an industrial oven, at 70 ° C for at least an hour** (as per Reg. CE 1069/2009 and 142/2011 and subsequent amendments and additions) ensuring the absence of pathogenic organisms for humans and plants, allows to obtain **products with always very low and constant humidity to improve their smoothness and facilitate distribution** operations with common fertilizer spreaders.