RIO SOIL PRODUCTION

All soils manufactured and produced by RIO are blended so the finished product is of the utmost quality. Our *Premium* and *ECO* Multi-purpose topsoil are blended from different textured topsoils from various locations. This process allows the sand, silt, clay and organic matter content to be in a ratio the makes it conducive to vigorous plant growth.

The soils used in the blending process are inspected and if need be tested prior to our acceptance and are also tested once blended. Soil testing for finished product quality are performed by an independent laboratory certified by UKAS. Some in house tests are performed regularly to ensure even distribution of soil blends and component sources. Testing is performed based on the volume of the material manufactured and sold.

The ingredients, ratios and particle sizes are determined by RIO to best meet the criteria of the application and environment.

IMPORTANCE OF TOPSOIL

Topsoil is the outermost layer of soil that naturally resides on the earth's surface. It is typically between 5 – 8 cm deep, but can be up to 0.5 - 1 m in depth in some places.

This top layer of soil is becoming an increasingly endangered commodity in the world. It is disappearing much faster than it can form, since it can take anywhere from 200 years to as much as 1000 years for a single inch of the nutrient-dense material to form but it is being depleted at a much faster rate. This can eventually become an environmental catastrophe as the soil is necessary for plant growth.

An estimated 2.9 million tonnes of topsoil are lost each year in the UK alone (DEFRA 2015).

Approximately 10% of the world's carbon dioxide emissions are stored in soil.

Topsoil provides all the nutrients required for successful plant growth.

Typically soil consists of 45% minerals, 25% water, 25% air and 5% organic matter.

Topsoil is filled with organic matter, microorganisms and nutrients that grass and plants need to thrive – the essential nutrients in the soil dissolve in water, making it easy for roots to absorb.

Much of the organic matter in topsoil is derived from decaying plants and anything else organic that dies, such as insects, worms, leaves, etc. Once dead, the decay allows the nutrients in the previously living matter to be returned to the soil.

The amount of sand, clay and silt is what gives different soil types their various textures. Most soils are a mix of all three. There are more microorganisms in a handful of soil than there are people on earth.

TOPSOIL greatly reduces flood risk by storing up to 9200 tonnes of water per acre. In total that's about 0.01% of the Earth's total water.

Soil acts as a filter for underground water, filtering out pollutants.

Worms enrich topsoil by feeding on organic material in the soil and converting it into nutrients for plants. As they move through the soil it becomes more absorbent and better aerated too.

Soil is at the bottom of the food chain, yet it is the cornerstone of life on earth.

SOIL NUTRIENTS FOR PLANT GROWTH

Nitrogen

Required for the growth of leaves and stems, its deficiency causes weak, stunted growth and yellowing of older leaves. However, excess nitrogen can also be detrimental causing such effects as disproportionate leaf growth at the expense of other parts of the plant (e.g. flowers).

Phosphorous

Principle nutrient for root growth and development, deficiencies may be seen through stunted root systems whilst the leaves on some plants may also exhibit a dull green or purple coloration.

Magnesium

A constituent of chlorophyll, the green pigment which enables plants to photosynthesise, magnesium deficiency may be noted by the interveinal yellowing of the plant's older leaves.

IMPORTANCE OF SOIL ORGANIC MATTER (SOM)

We've known for many years that soil organic matter (SOM) is important for production agriculture, as well as commercial and residential use .When soils were tilled initially, the soil organic matter concentration decreased fairly rapidly supplying nutrients essential for crop production.

There is no question that SOM has several properties that are important for modern crop production. Sometimes, the importance of SOM is over-emphasized. There are other situations where the importance of soil organic matter is neglected. So, it is important to take a detailed look at these properties and how they affect crop growth.

SOM is a complex mixture of various compounds, all of which contain carbon. Some are simple; others are complex. They all are broken down (mineralized) by the action of soil organisms. Sugars and other closely related compounds are easily mineralized with the process taking weeks; frequently completed during a growing season. The more complex compounds are more resistant to mineralization and it may take one or more years. These compounds are frequently placed into a category called "humus".

There are two steps in the decay of any organic matter present in soils. These are:

- organic matter + oxygen produces carbon dioxide, water, and humus.
- humus + oxygen produces carbon dioxide and water.

SOM improves conditions for plant growth in mineral soils in several ways. It increases water holding capacity a major benefit for sandy soils but also for beneficial in fine textured soils. It also loosens the fine textured soils improving soil tilth and thereby increasing water infiltration and absorption.

When soil erosion is considered, soils that have a higher organic matter content have improved structure because the soluble organic matter binds clay sized particles together to form improved aggregates. Both fresh organic matter and humus absorb water like a sponge – holding about six times their weight in water.

The humus in soils has an impact on nutrients in the production environment where it serves as a storehouse for nitrogen, phosphorus, sulfur, and most micronutrients. Considering nitrogen, there are various estimates that each percent of organic matter contains about 1,000 pounds of nitrogen per acre. Not all is available for crop production in any given year. There are measurements which show that, annually, approximately 25 lb nitrogen/acre is available from each 1% of soil organic matter.

In general, humus contains most of the soil's supply of boron. About 60% of soil phosphorus and 80% of soil sulfur are in soil organic matter (primarily the humus component). The humus is present as a collection of very small particles. Water and plant nutrients such as potassium, calcium, and magnesium cling to these particles in the same way that iron filings cling to a magnet. In this way, the humus material improves the availability of some nutrients.

Modern management practices which produce higher yields have had a positive effect on the amount of organic materials added to soils. Higher residue crops, reduced tillage intensity and the use of cover crops contribute to maintaining, even improving the organic matter content of our soils.

SOIL TESTING

The United Kingdom Accreditation Service (UKAS) is the sole accreditation body recognised by government to assess, against internationally recognised standards, organisations that provide certification, testing, inspection and calibration services. Accreditation by UKAS demonstrates the competence, impartiality and sustainable performance of these evaluators.

Our soils are tested by UKAS accredited laboratories against BS3882:2015 standards to ensure they are safe as well as suitable for use in all multi-purpose topsoil applications in commercial, industrial and residential areas.

Our soils all meet or exceed the criteria set out by the BS3882 standards and we are happy to supply a typical test certificate from our regular testing batch, but please note we do not certify the soil, as composition of percentages of constituent materials and chemical components can change with heat, temperature, humidity etc.

We regularly test to assure our soils are free from asbestos contamination, are within the size gradings and nutrient content requirements of the British Standards for BS3882 Soils.