# What's a consortium anyway??

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The Mammoth Microbes team often refers to microbes working together as a *consortium*.

One key concept in soil ecology is the importance of communities over individual species. No single species functions alone in nature; rather, groups of plant and microbial species often form consortia of closely interacting species that need each other for survival. Soil microbes communicate with each other by emitting and detecting small molecules. A microbial consortium is a true partnership of closely interacting species.

In natural and agricultural systems, plant success is driven by the ecological interactions between plants, microbes, and soil or soilless media. A true microbial consortium is a group of two or more different species that work together and function at a higher level than they could alone. There are several reasons why consortia can be more powerful and robust than single bacterial species or groups of bacteria that don't closely interact.

First, there are many soil functional processes that require more than one microbial species to complete a process. For example, some aspects of nitrogen cycling require separate reactions catalyzed by different types of bacteria. Likewise, no single bacterial species can complete the whole process – and each metabolic product is handed off to another species to complete the next step. This is similar to the division of labor in an assembly line, where skilled workers complete specialized tasks and each step is critical to the process. In nature, many microbial processes are structured in a similar manner!

Second, microbial consortia can be more robust to support plant health than single species. For example, consortia are more resistant to invasion by competitors and better able to withstand environmental fluctuations. In part, this is because the different members of the consortia thrive under different conditions to maintain critical soil nutrient cycling when other members may be under stress.

There is no 'single solution' when it comes to growing cannabis; it truly takes an integrated management system to succeed. When developing microbial solutions for cannabis cultivation, we think holistically about the ecology of the different belowground processes that are important for plant growth. Incorporating the power of microbes into sustainable management systems allows plants to maximize their phenotypic potential for quality and yield. Other benefits of utilizing microbial consortia include the fact that they work well in many different systems. Furthermore, beneficial microbes are often compatible with other microbial inputs and complement healthy soil food webs in organic soil systems.

Soil microbes are critical for plant success in nature. Growcentia believes that adopting microbes into cultivation practices is one of the best ways growers can sustainably increase plant quality and yield.