

RESEARCH FOR RESULTS



SOILBIOTICS SB4400 AND BIOFILMS

A SHORT INTRODUCTION TO PLANT BIOFILMS

As we continue to study and understand the role of microbes in plant health, much of our focus has been on soil-borne microorganisms and their relationship with the plant root system. But there are microbial populations on all exposed plant surfaces, including the leaves. Their effects on the plant can be both positive and negative. Some of these microbes may cause disease on plants, but most are either harmless or beneficial symbionts. Populations of these microbes multiply in response to the plant environment and often form multicellular communities ranging in size from small colonies to large, highly-structured biofilms. Microbes form a biofilm on plant tissues which include cellular recognition of specific or non-specific attachment sites on the plant surface. The biofilm prevents pathogenic spores from recognizing the leaf surface so germination of the spores is aborted, thereby allowing the beneficial bacteria to out-compete the pathogens before damage can be done to the plant.

The structure, activity and diversity of microbes harbored within biofilms will influence the plant interaction to varying degrees, dependent on plant type, growth stage and environment. Conversely, plants themselves can influence the bacterial population density. They can foster communities that interact with each other and the entire plant structure through metabolic activity and cell-to-cell communication mechanisms. This allows the microbes on all plant surfaces, from leaf to roots, to coordinate their activities and optimize competitive success.

SB4400

SoilBiotics **SB4400** is a group of living beneficial microorganisms. It includes nitrogen fixing and phosphate solubilizing microbes that have the ability to stimulate enhanced growth and performance in many plants. It is 100% naturally occurring and non-pathogenic.

Foliar application of as little as 4 ounces per acre of **SB4400** along with foliar fertilizers and humic substances allows beneficial bacteria to colonize plant surfaces and enhance biofilm growth. For example, we have seen increased yields in soybeans following the application of a combination of **SB4400**, foliar fertilizer and humics at R3 stage, replacing the application of foliar fungicides.

CONCLUSION

Nature has provided plants with a variety of symbiotic mechanisms, and microbial biofilms are a prime example. But, they can always use help to maximize plant yield potential. It is highly beneficial to find methods and products which provide a naturally occurring boost to nature's own features. **SB4400** can help growers accomplish this goal.