

# SANCTUARY BUILDS MICROBIAL SUSTAINABILITY

Sanctuary is an energy rich food source for soil microbes. Sanctuary products contain protein meals and carbohydrates, which provides the nutrition to explode the native soil microbial levels. The Sanctuary organic ingredients are converted into more soil microbes.

Each Sanctuary product has a nutritional value that can be defined as their Total Digestible Nutritional Value or TDN Value. The main reason for using Sanctuary natural products is this energy value. Simply, Sanctuary products have 4 times the energy of manure products and 40 times the energy value of bio solid products.

As the soil microbes utilize this food source, the microbes begin a natural growth cycle. During this growth cycle, these microbes compete for this nutrition. It is the growth and decline of these microbes that nutrients are mined and released to the soil. Plus, this growth promotes a competitive microbial balance that delivers agronomic benefits. These benefits promote soil health reducing agronomic problems. Simply, this cycling of microbes by Sanctuary promotes this soil health balance. There are 4 phases of microbial growth:

## > LAG PHASE

During this phase, the microbes begin the growth cycle process. Microbes absorb nutrients, synthesize enzymes and begin to increase their populations.

## > LOG PHASE

During this phase, the microbes rapidly increase their populations while building nutrient and enzymatic reserves in the soil. It's these processes that deliver the future agronomic benefits.

## > STATIONARY PHASE

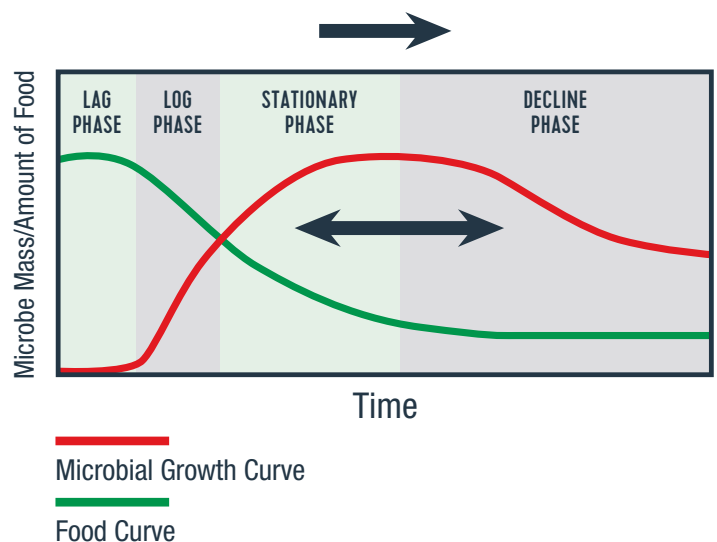
During this phase, the microbes continue to utilize the nutritional energy found in Sanctuary ingredients. In this phase, there begins to see a level of microbial growth. The numbers of microbes reach a population plateau. The microbial growth and decline are equal. It is during this phase that the agronomic benefits of Sanctuary are the highest.

## > DECLINE PHASE

During this phase, the microbial population begins to decline due to the lack of additional food. It is during this phase that agronomic benefits are reduced.

## MICROBIAL GROWTH

Food to Mass Ratio Decreases



From our research, we have found that this cycling time is around 8 to 16 weeks. The length of release is affected by soil temperature. The higher the temperature – the release time can be reduced. If another application of Sanctuary is applied, this cycling process begins again.

The Stationary Phase can be maintained by multiple applications of Sanctuary products in a growing season. We have also found that once this Stationary Phase is reached, lower rates of Sanctuary can be applied to maintain this stage. Plus, repetitive agronomic issues can be reduced. This approach reduces the dependence on pesticide products.