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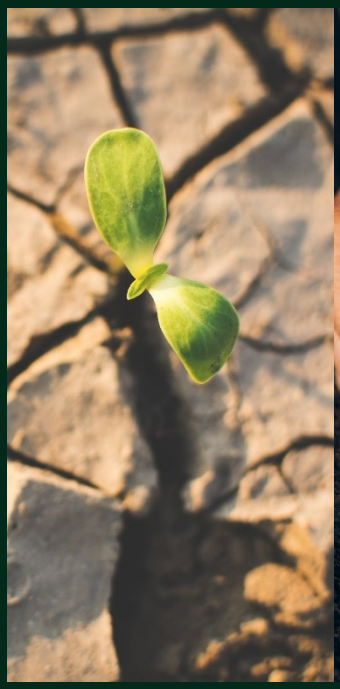
METABOLISM

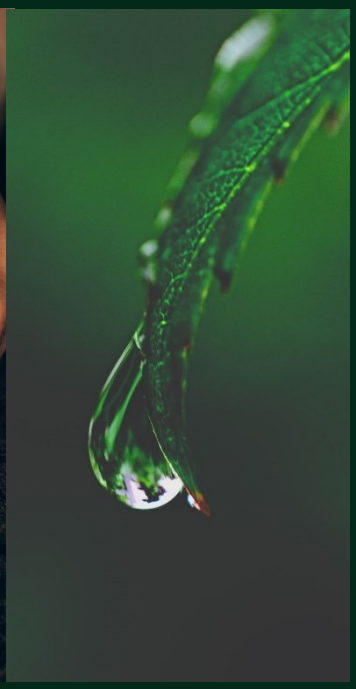
Plant Physiology under Abiotic Stress Conditions

Non-GMO, Non-Chemical, Non-Pesticides

A Cellular Regeneration Biotech with HQ in Singapore

Official Website: www.ibiostim.com





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Editor Dr. Jeff Lim

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OPPORTUNITY IN AG

Abiotic stress conditions, such as drought, frost/cold snap, extreme precipitation and temperatures, and nutrient deficiencies, significantly challenge plant metabolism and growth leading to productivity pressure. These stresses can lead to delayed harvests, reduced crop yields, poor fruit quality, and increased vulnerability to diseases, giving rise to economic losses. Understanding how plants, particularly their root systems, respond to these stresses is crucial for developing resilient agricultural practices.

SOLUTIONS FOR IMPROVED RESILIENCE

Several strategies can be employed, including:

i) Developing specific crop varieties with improved stress tolerance through traditional cross breeding and modern genetic engineering techniques,

ii) Improving soil structure and health through organic amendments, mulching and proper irrigation practices,

iii) The use of bio-enzymes to speed up nutrient cycling, addressing the missing link in modern agriculture, which are considered largely sterile due to synthetic chemical overuse.

SOLUTIONS FOR IMPROVED RESILIENCE

The use of nature derived bio-enzymes is not new, dating back to pre-industrialised era. These biomoledules play a crucial role in enhancing plant resilience to abiotic stress through bioconversion of macro and micronutrients in the soil, creating a constant supply of enriched cationic envelop around the root system in the region known as the rhizosphere. The rhizosphere is responsible for symbiosis in C3, C4 and CAM plants. Fungi and bacteria are part of this vibrant eco-system in continuum.

By speeding up nutrient conversion cycle and metabolic curve, in-plant glucose production and glucose exudation through the root system sustained host plants and soil equilibrium, similar to how the human gut comprised a balanced eco-system of good and bad bacteria necessary to support gut health through regular pro-biotic intake. In green plants, improved plant metabolism manifest as higher plant vigour, during a) vegetative, b) flowering, c) fruiting, d) post-harvest, e) breaking dormancy in spring.

The key then lies in maintaining healthy equilibrium through regular supply of bio-enzymes, macro and micronutrients in small doses, at regular intervals, in sync with the metabolism of various C3, C4 and CAM plants under commercial cultivation.

Modern agriculture based on heavy synthetic chemical regime tend to tip this

ACTIVITY AND APPLICATION ON FRUIT TREES

Fieldwork by ChongMing

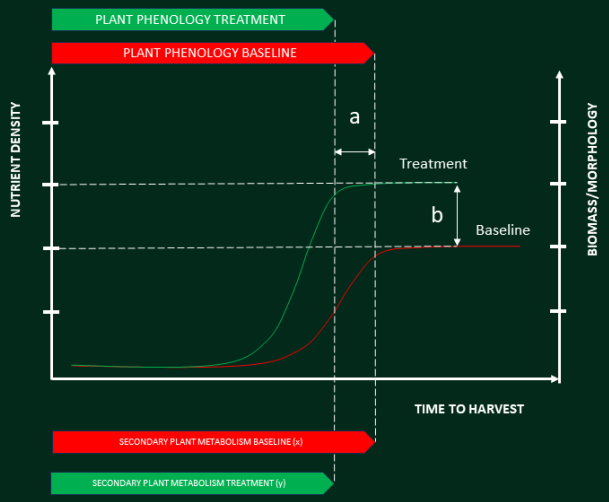
delicate equilibrium in the soil, negatively influencing on the plant's natural ability to build defence against abiotic stress. Fortunately, the incorporation of bio-enzymes and commensurate bio-fertiliser into any organic and conventional farming systems addresses this GAP is the whole of AG.

APPLICATION

If we define plant health as a function of primary (growth) and secondary (defence) metabolisms, both sharing a common pool of cellular energy (CE) always in sync with the life cycle of each variety on plant earth, then the presence of abiotic stress will shift the CE budget, from growth kinetic model to one that is focused on defence mechanism.

Beyond the temperature range of 14 to 35 degree Celsius, stomata on underside of leaves will close, preventing photosynthesis in C3 plants. In C4 plants, cellular activity persists until all energy budget is utilized in secondary metabolism, forcing the plant to enter into a remission state for protection. This also explained under abiotic stress conditions, productivity is severely compromised in the absence of a constant pool of bio-enzymes, macro and micronutrients, to keep the CE budget viable sustaining the life cycle of C3, C4 and CAM plants.

In just 3 months of substrate and foliar applications, the cell walls will



thicken substantially (crop specific), manifesting as higher sucrose/glucose content with visible modification to physiology and chlorophyll density, with everything being equal. This improvement also manifests as improved organoleptic taste and natural fragrance due to abundance of volatiles emitted by plants through secondary metabolism as indicator of overall plant health.

Increasingly, climate change is influencing harvest outcomes for orchards, from the Pacific Rim on extreme precipitation causing substantial harvest delay for berries, to cold snap in Canada that destroyed 70% of cherry harvest, and extreme heat in Italy that challenged cultivation viability, beyond irrigation sufficiency.

Being prepared can be as easy as diving into bio-enzymes that withstood the test of times. Are you already prepared for your next harvest through early planning?

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