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FEATURES OF THE APPLICATION OF BIOLOGICAL PREPARATIONS

A huge mistake among agricultural manufacturers is attempting to combine several processes into a single technological method, such as application of chemical protection agents, biological preparations, trace elements or growth regulators. Microorganisms are living beings, so the efficiency of their use depends on the adherence to several basic rules:

1. Trace elements play an important role in the biochemical processes of plants, yet most of them are heavy metals, and their concentration in tank mixtures can be toxic to microorganisms. Hence, it's advisable to refrain from combining bacteria with trace elements for seed treatment or soil application.

2. When treating seeds with any (recommended) chemical pesticides in combination with inoculants, it's essential to dilute the chemical preparation in water first and then add the biological preparation.

3. All microorganisms are susceptible to solar ultraviolet radiation. While many companies add chemical ultraviolet filters or loose carriers to liquid biological preparations to shield bacteria from UV rays, it's prudent not to overlook simple rules such as conducting seed treatment indoors or in sheltered places, and applying a microbial preparation to soil during the periods of low solar activity (6:00 p.m. to 10:00 a.m.) or under cloudy conditions. The use is also permitted during the daytime in sunless weather at temperatures not lower than 15°C. Optimal conditions ensuring the efficiency of the preparation are pH levels of 5.0-7.0, temperatures ranging 15-40°C, and soil moisture levels of 60-70%.

4. Microbial preparations are quite sensitive to storage time and conditions. Ideally, they should be stored at temperatures ranging 2 - 8°C. While numerous advancements in technology mitigate the effects of high temperatures on microbial viability, adherence to these storage requirements is crucial to prevent preparation spoilage and save time, effort, and resources.

5. Applying microbial preparations foliarly during the plant growth stage may actually seem pointless and makes many farmers skeptical, since it is well known that bacteria die in sunlight. As a matter of fact, the efficiency of biological preparations in this case stems not from the bacteria themselves, but from the byproducts of their synthesis, which include not only phytohormones, antibiotics, amino acids, or organic acids, but also lots of signaling molecules capable of effectively regulating plant metabolism. Moreover, their quantity and ratio are naturally balanced. Here, combining them with chemical protectants or growth regulators is possible, although caution is needed because the presence of two or more growth regulating substances can have an antagonistic rather than synergistic effect.

6. Combining several biological preparations with different properties isn't always effective. Microorganisms use plant root secretions for nutrition, and introducing two or more beneficial bacteria into the rhizosphere may foster their competition for resources, diminishing the efficiency of each. This is particularly relevant for legume crop inoculants.

7. And here is the fundamental rule: when in doubt about the correct use of biological preparations, don't hesitate to contact the manufacturer for detailed instructions. This will benefit both you and the manufacturer, as it will prevent unnecessary complications for you, while providing the manufacturer with valuable feedback to improve the development of new preparations.