

BioJect Update

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Considerable research has been directed toward biological controls due to public concerns of pesticide safety, environmental concerns, loss of chemicals due to reregistration, and loss of chemicals due to resistance development. The important thing to remember when dealing with biological controls is that it requires the use of live organisms. Unlike chemical pesticides, live organisms require certain conditions to remain alive and have much shorter shelf lives than chemical pesticides.

Biological control is the use of one organism to manage the population of a pest or pathogen. Many of these biological control agents are naturally found in the environment, but at insufficient levels to provide significant disease management. To provide adequate disease management, it is necessary to increase the numbers of these organisms to reach a population threshold which provides acceptable disease management through direct application of the biological control agent. However, following application, the populations of these organisms generally decline due to their inability to colonize the given environment, competition with other organisms, and mortality due to environmental factors such as UV light and insufficient moisture. In order to maintain population levels of a biological control organism required to provide disease management, it is often necessary to apply the biological control agent frequently.

The BioJect System (EcoSoil Systems, San Diego, CA) is a recent technology that has been developed to help overcome some of the current shortfalls of biological control agents. This system allows the superintendent to grow the bacterial biological control agent on a daily basis. The process of growing the bacteria is automated within the BioJect which injects water, a nutrient solution, and bacterial inoculum into the culture vessel. The bacteria are grown for a period of time under constant aeration and mixing allowing them to grow and multiply. Following this incubation period, the bacteria are injected into the irrigation system and applied with the nightly watering. This process can be performed on a daily basis to maintain populations of the biological control agent in the field.