Soil Management Recommendations

Current soil management recommendations for increased pathogen suppressiveness are mainly based on increasing organic inputs to the soil, reducing disturbances such as tillage, and diversifying crop rotation.

To successfully enhance soil suppressiveness, it is necessary to understand how farming practices can improve key indicators of soil health as they relate to increased biodiversity of the soil ecosystem. These indicators include measures of nematode communities in the soil, microbial enzyme analysis, as well as physical and chemical soil components that were correlated with disease suppression and high yield.

The key areas that ginger growers need to work on to improve soil health are contained overleaf.

Issue

Declining soil fertility and biological soil health represent a major threat to sustainable ginger production. To remain competitive ginger growers have intensified crop production to supply growing markets, but have typically failed to replenish organic matter adequately. Ginger growers have consequently experienced falling yields and increased problems with soil borne pathogens that are symptomatic of declining soil health.
**Improve Soil Organic Carbon Levels:**

Organic carbon improvement is most cost effectively achieved through the use of break or fallow cropping. Fallow cropping not only allows for a change in species to eliminate host specific species of pest or disease, but provides the ability to improve soil structure, improve the biodiversity of soil microorganisms, and build organic carbon at faster rates than importing organic carbon sources. Ginger growers who have been serious about summer and winter fallow crops prior to planting ginger have clearly seen the benefits of building organic carbon and soil health.

**Reduction in Tillage Operations:**

The maintenance of soil carbon is all about reducing soil tillage methods that destroy organic matter. Always mulched, always incorporated but only rotary hoed once before planting. The use of bedded systems maintains compaction to wheel tracks only.

**Drainage Improvements:**

The ability for a soil to drain following heavy rain is critical in maintaining healthy soils. When soils become saturated for long periods they have low oxygen levels that cause beneficial organisms to die. The key to maintenance of oxygen in soils is simple: organic carbon, effective drainage and lack of soil compaction.

**Increased Use of Mulches and Composts:**

Our industry has had success in controlling soil borne pathogens of ginger where fallowing, fallow cropping, drainage improvements and the use of biologically active composts and controlled release fertilisers are utilised. This improves soil health through building of beneficial microorganisms, while reducing death of these beneficials from acidic fertiliser use and lack of oxygen in the soil profile.

**Farm Quarantine:**

Farm quarantine involves exclusion, which in turn is about restricting movement of soil and infested planting material between blocks and between farms. This is critical when dealing with soil borne pathogens.

**Utilise Technology:**

We need to be familiar with and use technology to our benefit. Soil and tissue testing, precision farm mapping and irrigation management are key to success. Attention to technology management will ensure you achieve a reputation for yield and quality.

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