

## **Development of Soil Sustainability Index (SSI) for Highly Weathered Soil Amended with Bioenhancer Bio- and Organic Fertilizers and Mono-cropped with Grain Corn.**

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### **Introduction**

Bungor series (Order ultisol) is a highly weathered soil that usually lacks in nutrients, has low pH and poor soil physical properties. Soil Sustainability Index was used to evaluate the Soil Quality and the Sustainability Value of Bungor Series soil maintained under different planting systems. It was also used to identify indicators involved in physical, chemical and biological properties besides understanding the relationship between Soil Sustainability and Soil Quality.

### **Materials and Methods**

Soil samples from the Bungor series were taken to a depth of 50 cm, dried for one week and analysed to obtain several physical, chemical and biological properties. The experimental sites, located in UPM Farm, Serdang, Selangor, were originally planted with oil palm and rubber (plantation crops), pasture crop (non-shaded perennial crop) and an open range soil treated as a control.

### **Results and Discussion**

Results showed that the Soil Sustainability Index of the highly weathered Bungor series soil for the open range soil (control), pasture crop (non-shaded perennial crop), oil palm and rubber (plantation crops) were 0.24, 0.29, 0.38 and 0.37, respectively. These index values, which are influenced by the physical, chemical and biological properties, showed that the plantation crops gave a Soil Sustainability Index value closer to the value of 1, the maximum index value. The results also showed that the Soil Quality of the oil palm and rubber crops were higher compared to the other planting systems.

### **Conclusions**

Soil with plantation crops (oil palm, rubber) produced higher Soil Sustainability Index and Soil Quality than those cropped with pastures or under open range systems

### **Benefits from the study**

The findings can be used to develop policies for sustainable agricultural development based on the respective crop history of the land.

### **Patent(s), if applicable:**

Nil

### **Stage of Commercialization, if applicable:**

Not applicable

### **Project Publications in Refereed Journals:**

Nil

### **Project Publications in Conference Proceedings:**

Nil