Development and testing of wetland sludge core sampler. (Patent No:13451)

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Augers and core samplers are used to collect soil samples from various soil depths. These soil sampling tools have been proven in the field by professional soil scientists, soil conservation technicians, agriculture teachers, botanists, biologists, engineers, and foresters. Generally, augers are designed for regular sampling applications. But core samplers are specially designed to collect undisturbed upland soil samples.

The lowland soil which is saturated, puddled or flooded has special characteristics. It has flow able liquid consistency. Hence, to collect the undisturbed soil samples in lowland sludge soil, it is necessary to have a special mechanism to prevent sample escape from the convectional core samples.

Considering the above fact a low cost suitable core sampler with a unique disc value was designed and constructed. The invented PLAG wetland core sampler consists basically of sludge sampling tube with removable core tip for sample collection, non escape disc value with bend lever for prevent sample escape, value protection cover with auger handle and piston type plunger with push rod for sample removal.

An experiment was conducted to compare the performances of the designed core sampler with existing core sampler. For that purpose three ploughing practices such as mechanical land preparation (two × 0.15m ploughing and three harrowing), minimum tillage (rototilled) and zero tillage were conducted in the paddy field. The invented core sampler and existing core sampler with metal plate were used to collect undisturbed soil samples in the wetland sludge soil of the experimental field.

The results revealed that the average bulk density values of the lowland puddled clay soil collected by invented core sampler and existing core sampler in the field of mechanical land preparation, minimum tillage and Zero tillage were 0.66,0.60 mg/m^3, 0.97,0.89 mg/m^3 and 0.99,0.95 mg/m^3 respectively. However above observation for clay loam soil were 0.98, 0.90 mg/m^3, 0.99, 0.95 mg/m^3, 1.17, 1.15 mg/m^3 respectively. Furthermore results showed that the puddling changed bulk density in a clay soil. But the different bulk density values obtained by two core samplers were not significantly different. On the basis of above results, it can be concluded that the invented wetland sludge core sampler (patent no: 13451) is useful to obtain the soil physical parameters of the wetland soil.