The conventional system of viticulture is a monoculture of vines with extensive application of chemicals to ensure crop quality and quantity. In a decade, soil degradation occurred in vineyards due to water stress, insufficient of nitrogen and organic matter content, low C:N ratio which disrupted the rhizosphere ecosystem, nutrient imbalance, poor drainage and low cation exchange capacity. It consequently caused soil erosion (Costantini, 2018). Furthermore, soil erosion was also caused by soil stability. The intensive cropping would rapidly reduce the soil’s organic carbon content , significantly affecting soil stability and reducing the water infiltration rate (Le Bissonnais & Arrouays, 1997). The vineyard in the Mediterranean areas often facing in soil functioning and the ecosystem. It had been proven that the practices of cover cropping and inter-row cropping gave a positive impact on soil functioning(Salomé et al., 2016).