Name	**Mlambo Cephas**
Project Title	**Introduction of four nitrogen-fixing legumes in inter-row intercropping with *Sorghum bicolar* under conservation agriculture in the smallholder sector of Zimbabwe.**

Abstract

Inorganic fertilizers are out of reach for most Communal farmers in Zimbabwe. As a result, 40% of smallholder farmers use manure while 5% use inorganic fertilizers (Twomlow, 2008). Studies show that efficient nitrogen fixing legumes may be self-sufficient in nitrogen and have potential for supplying non-legumes with their nitrogen needs if grown under similar conditions (Piha, 1997). Extension agents have been encouraging farmers to diversify their cropping systems under conservation agriculture (CA) and Conventional tillage (CT) to militate against extractive crop production in the smallholder sector without empirical evidence to support it. In response, farmers introduced food legumes in sequence with cereals. Usually, plots put under cereal are larger than plots planted to legumes. This mismatch in the size of legume and cereal crop fields means that the benefits of legume biological nitrogen fixation (BNF) are not fully realized. Also, if farmers were to totally depend on legumes to meet the N requirements of non-legumes through rotation, they would need half the agricultural land planted to BNF legumes. Due to limited land in the smallholder sector, this is not practical. Intercropping can solve this problem. It will allow farmers to grow cereals and legumes on the same piece of land at the same time and thus N will be fixed on the same land size as cereals. This study is introducing ground nuts (*Arachis hypogeae*), cow peas (*Vigna anguiculata*), velvet beans (*Mucuna deeringiana*) and sunnhemp (*Crotalaria juncea*) in CA to provide researched data on their contribution to sorghum productivity, soil fertility and mulch levels between 2015 and 2017. Two studies will be held in semi arid region of Chipinge District's low veld. The first experimental study will be a controlled trial to be held at Chisumbanje Experiment station in ward 26 (Chisumbanje). Randomized complete block design (RCBD) with 4 blocks and 4 replications will be used. Sorghum variety SV4 will be intercropped with the above

mentioned legumes in 30m2 sub-plots 4 weeks after the cereal. Mulch level will be 1.5t/ and basin size 15cm x 15cm x 15cm. The second study will be a field trial to done in wards 29 (Mutandahwe) and 30 (Mahenye) which border Gonarezhou National Park (Great Limpopo trans-frontier park). 32 farmer fields will be selected. At each field, one of the legumes tested in the controlled trial will be planted into sub-plots, 30m2 in size. Adjacent pure sub-plots for legumes and sorghums will be established under CT and CA. Plant growth, biomass, soil fertility and weed incidence will be evaluated.