1.1.3  **Mate Albert M. (1998). Evaluation of three forage legumes and intercropping pattern for improved productivity of maize (*Zea mays* L.) (Supervisors: Dr. D. M. N. Mbewe and Mr. C. Chileshe).**

The objective of the study was to determine a maize / forage legume combination and an appropriate row arrangement that would result in high maize grain and total stover / legume straw yield, enhanced crude protein content of the maize stover / legume straw and increased crude protein content of the maize grain and stover. This would form a basis for the good quality feed for cattle during the dry season. The treatments consisted of the maize variety MM603 intercropped with the three legume species namely cowpea (*Vigna* unguiculata (L) Walp), siratro (*Macropitilium atropurpureunty* and archer (*Macrotyloma axillare*) in either 1: 1or 2: 1 row arrangement. A Randomised Complete Block Design was used with four replications. Data was collected on the following parameters: maize plant height, legume spread, maize grain and stover yield and crude protein content, legume straw yield and crude protein content as well as the legume straw and maize stover non-detergent fibre content. Analysis of variance (ANOVA), separation of means and correlation analysis were carried out on the field and laboratory data collected. The maize/forage legume combinations and their row arrangements did not increase the maize grain yield and the crude protein content of the maize grain and stover. However, the addition of the forage legume straw to the maize stover enhanced the crude protein content or the dry matter yield by about 3-4 times i.e. 3.3 to 4.6 % in the maize stover and 13.8 to 16.4 % in the forage legume straw. The plant height of the sole maize (2) of 1.48m was significantly taller and had a higher crude protein content of 11.15 % in the maize

grain than the sole maize (l) and the intercrops. Cowpea exhibited the highest plant spread of 1.88111 which was positively correlated (r = 0.84)** with straw yield but was the least in crude protein content of the straw (13.4 %). Cowpea was able to grow and complete its life cycle being an annual crop compared to archer and siratro which are perennials and hence were still growing at the time of harvesting the maize crop. The results demonstrates that maize can be intercropped with the three forage legumes in either 1: 1 or 2: 1 row arrangement and result in improved quality and quantity of the total dry matter which can be fed to livestock. However, the maize crop could not directly benefit from nitrogen from the three forage legumes.