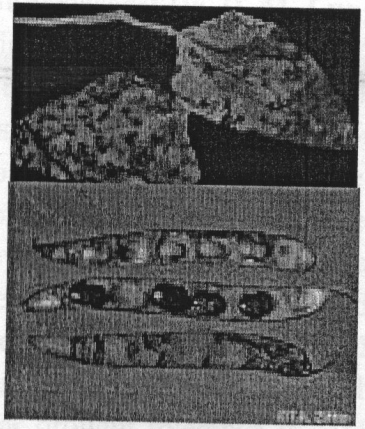
acquisition and inoculation.

 # 2.1.4 Zulu, Mathias. (2004). Race identification and distribution of bean anthracnose (*Colletotrichum lindemuthianum*) in major bean growing areas of Zambia and their implication in breeding for resistance. (Supervisor: Dr. D. M. Lungu).

A study to determine the distribution and relative importance of bean anthracnose and to identify and characterize races of this fungus in the major bean production areas of Northern, Luapula and Northwestern provinces of Zambia were conducted in three stages in 2004. The stages involved a field survey and



two experiments in the field and laboratory, respectively. The objective of the study was to gain information on the type of anthracnose races prevalent and the magnitude of their variability in Zambia in order to develop appropriate and sustainable control strategies by way of breeding for resistant varieties for adoption by resource-poor farmers. The survey was employed to collect disease samples and determine the severity and incidence in Kasama, Mbala, Mpika, Samfya, Mansa, Solwezi and Mwinilunga districts. Anthracnose fungus was found distributed in all major growing areas with medium to high severity in 76% of the 90 fields surveyed. Angular leaf spot, common bacterial blight and rust were the other diseases found distributed in the target areas in descending order of frequency. Anthracnose was most severe in Mwinilunga while incidence was highest in both Mbala and Mwinilunga districts. All local landraces in the target area were susceptible to anthracnose attack. A total of 14 different races of anthracnose were characterized on the basis of 12 CIAT standard differential cultivars from 22 isolates collected from production areas. Race determination results confirmed that there was great variability of anthracnose in Zambia. Races in Mansa and Mwinilunga showed resemblance among them while race 65 and 73 resembled those characterised in North America. The majority of the races attacked cultivars of Andean origin though some race-specific resistance was found in genotypes from both centers of origin of beans. Exotic accessions Tu, AB136 and G2333 were resistant to all races of anthracnose characterized in the study both in the field and laboratory experiments. Eighteen genotypes tested in the field revealed that anthracnose attack was significantly high ($P \leq 0.05$) at flowering and podding stages of bean development at Mutanda Research Station (12°25.88'S and 26°12.59'E). The study provided some essential information needed to develop effective breeding and/or crossing programs against bean anthracnose that exhibits high pathogenic variation. It is therefore imperative that gene deployment and pyramiding are employed together with other sustainable control strategies in order to minimize losses inflicted on the bean crop.