EMERGING DISEASE PROBLEMS: THE CASE OF SOUTHERN BLIGHT OF COMMON BEANS

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In Uganda, root rots of common beans (*Phaseolus vulgaris* L) in the past were commonly known to be caused by *Pythium* spp. and *Fusarium solani* f.sp. *Phaseol*i. However, in recent field visits, researchers observed an increasing number of wilting plants, showing fungal outgrowths such as fluffy white mycelia and white to creamy fruiting bodies (sclerotia) at the base of the plants. These plants were confirmed to be infected by *Sclerotium rolfsii* Sacc., the pathogen that causes southern blight of common beans. A survey by the Legumes Programme at NaCRRI and CIAT reported wide spread distribution of southern blight in all bean agroecologies within Ugandan, with an incidence and severity of 100% and 84%, respectively in the worst hit district (Bugiri).

PRELIMINARY FINDINGS

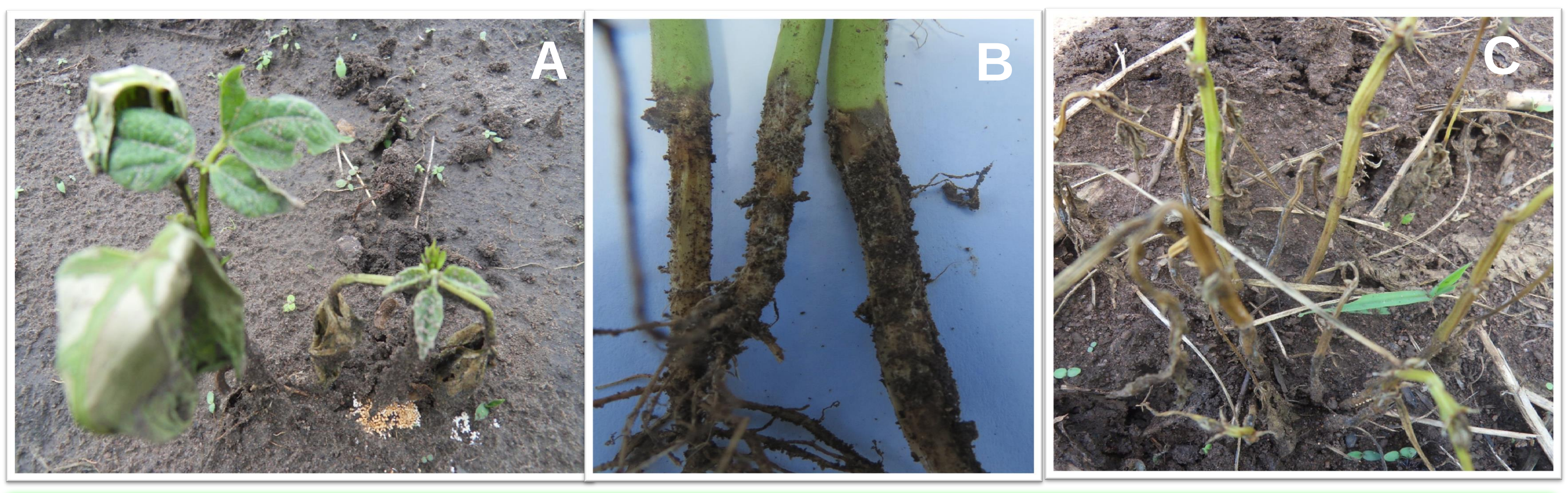

Figure 1. Symptoms of southern blight. Wilting seedling showing sclerotia out growth (A), darkened hypocotyl spotting white mycelia (B) and wilted bean stems in a severely infected field (c).

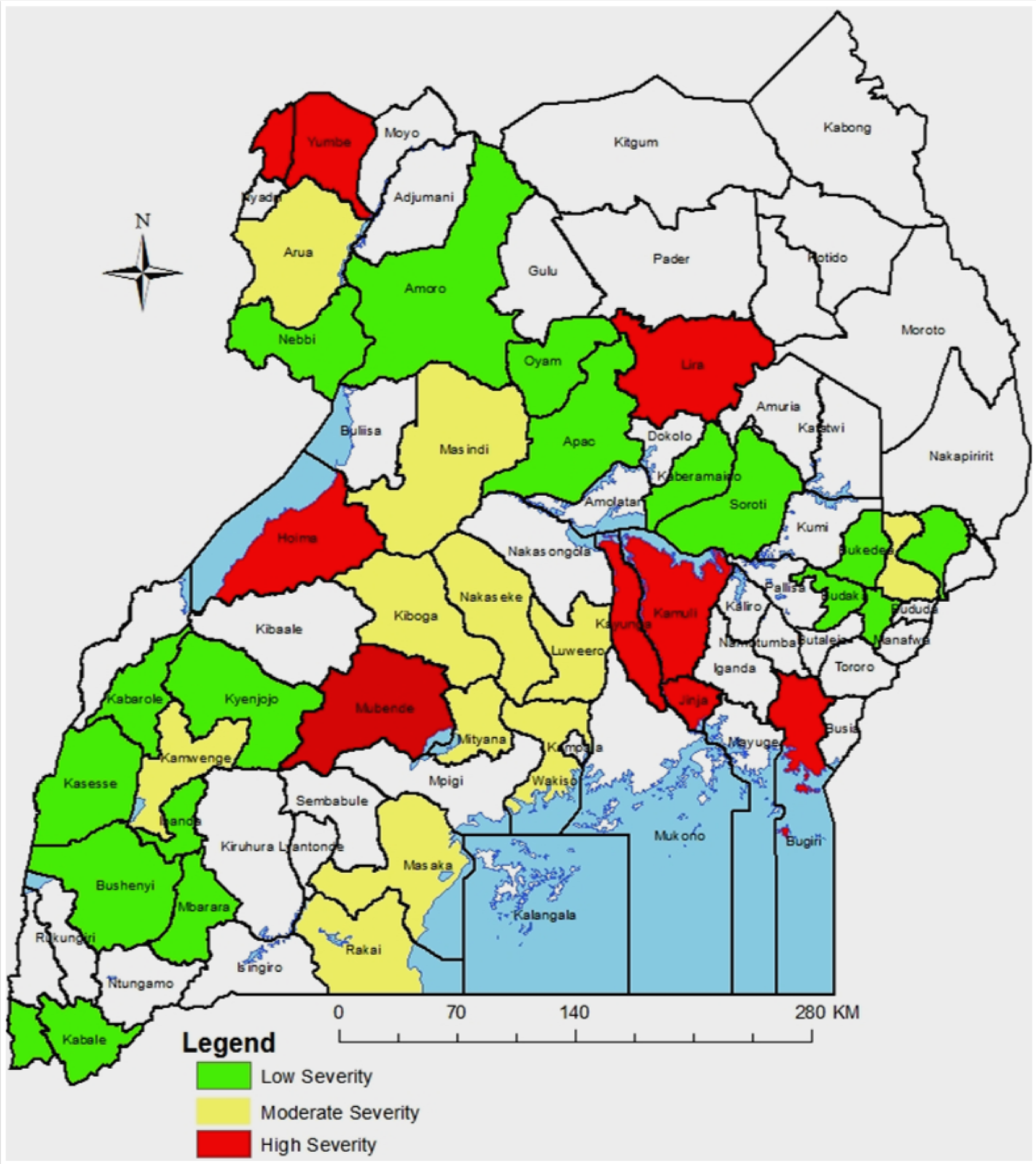

Figure 2. Incidence and severity of southern blight in surveyed districts. Low severity= 0-25%, Moderate severity= 26-50% and High severity= >50%.

ON-GOING RESEARCH EFFORTS

Phenotypic and genotypic characterization of *S. rolfsii* has commenced. All five varieties used in pathogenecity tests were susceptible, including those that are resistant to *Pythium* spp. and *F. solani*. Genotyping data shows differences between isolates within and across bean agroecologies.

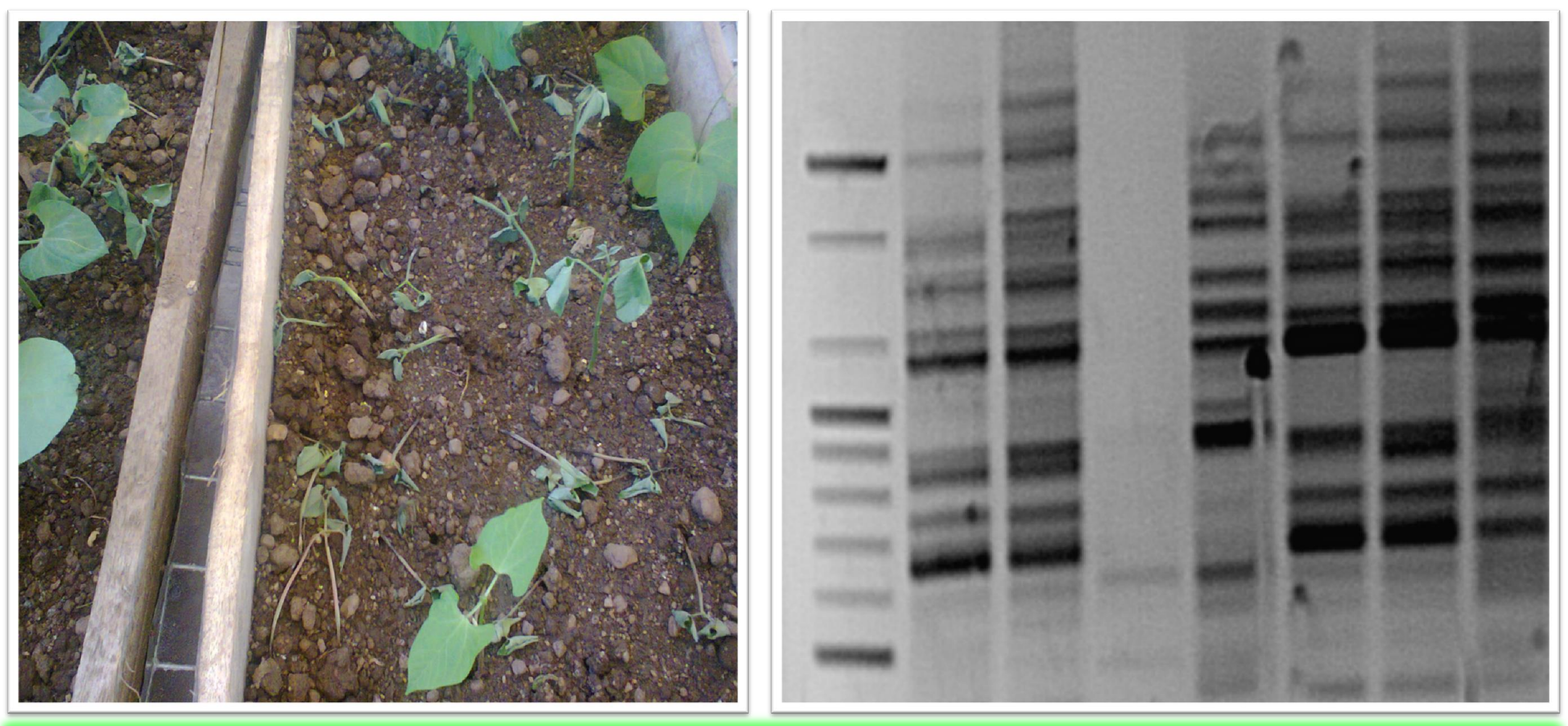

Figure 3. Seedlings wilting after inoculation with the highly virulent *S. rolfsii* isolate Hoi 344-2 (left), and banding patterns of *S. rolfsii* DNA following amplification with Random Amplified Microsatellite (RAM) primers (right).

Screening of several bean lines from different nurseries and of local germplasm to identify sources of resistance to southern blight has started at NaCRRI and CIAT Kawanda.

Figure 4. Differential reaction of common bean lines to *S. rolfsii*. A single tray has 5 different varieties planted in 2 rows each.

On-station yield loss trials to determine the economic significance of southern blight have been established. Varying inoculum levels were used to determine yield loss in NABE 15.

Figure 5. Yield loss trial at NaCRRI (left), and a section of the trial showing seedlings wilting from *S. rolfsii* infection (right).

FUTURE RESEARCH DIRECTIONS

After identification of common bean germplasm that is resistant to *S. rolfsii*, resistance markers will be developed. Mapping of QTLs that confer resistance to *S. rolfsii* will be done in collaboration with the University of Reading, UK. QTL-linked markers will be identified using Single Nucleotide Polymorphism (SNP) genotyping. At NaCRRI, we shall improve preferred market class varieties by pyramiding resistance genes for root rots (Pythium, Fusarium and Sclerotium), angular leaf spot and anthracnose diseases.

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