Fertility in Bambara Groundnut: Identifying the factors that limit fertility in Bambara groundnut, with particular focus on the effect of environment on pod set (Code: Bam1-009)

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'Crop fertility' is a major issue and is likely to become more in the ever changing environmental conditions particularly under high temperatures, which leads to significant reductions in yield. Extreme temperatures are a major constrains to crop adaptations and productivity, particularly affecting reproductive development. The reproductive stage of development is determinant of yield in crops cultivated for seeds or fruits. Bambara groundnut (*Vigna subterrenea* (L.) Verdc.) is an indigenous African legume cultivated mainly by subsistence farmers under traditional low input agricultural systems for its seeds. It plays a significant role in cropping system and is often intercropped with cereals, tuber crops, vegetables and other legumes.

The most important physiological characteristic of Bambara groundnut is its drought tolerance, which is of agronomic importance in semi-arid regions. It produces reasonable yields under low rain fed and high temperature conditions where many of the other crops fail. High-temperature stress can affect the reproductive processes such as pollen viability, female gametogenesis, pollen-pistil interaction, fertilization, and grain filling. Even a small increase in temperature above the optimum can negatively affect pollen viability leading to low yields. However there is very limited evidence on how different landraces of Bambara differ in their response to these temperature stress. It is essential to quantify any genotypic and/or phenotypic variations during growth and development under controlled environmental studies and later extend it to field conditions.

This study aims to explore the effect a short period of temperature stress on the reproductive development of Bambara groundnut and, quantify any effects on flower or pod abortion and low yield. The severity and variability of this effect will be determined using different landraces of Bambara groundnut. Little is known about floral transition and almost nothing

under stress conditions. Therefore the present research can be focused on identifying the factors that limit fertility in Bambara groundnut. A great deal of work remains; to develop and characterise mapping populations, to study temperature stress, to characterise these traits and genes, and to extend new genomic tools to underutilized crops through developing translational approaches.