## Second RUFORUM Biennial Meeting 20 - 24 September 2010, Entebbe, Uganda Research Application Summary

## Improving greengram production for nutritional diversification, income and food security in Uganda

Talwana, H. L.<sup>1</sup>, Elepu, G.<sup>2</sup>, Wanyera, N.<sup>3</sup> & Obuo, J.<sup>3</sup> <sup>1</sup>Department of Crop Science, Faculty of Agriculture, Makerere University, P.O. Box 7062, Kampala, Uganda <sup>2</sup>Department of Agricultural Economics & Agribusiness, Faculty of Agriculture, Makerere University, P. O. Box 7062, Kampala, Uganda <sup>3</sup>National Semi- Arid Resource Research Institute, P. O. Box Private Bag, Serere, Soroti, Uganda Corresponding author: haltalwana@agric.mak.ac.ug Abstract This project seeks options for improving greengram production and guidelines for promoting it as a crop for diversification of income and food security in Uganda. The project will analyze the greengram value chain system; identify the key constraints in production, consumption and marketing as perceived by farmers and other stakeholders; and map a direction for onfarm and on-station greengram research in Uganda. Greengram germplasm (wild, intermediate and cultivated) will be assembled and characterised to quantify genetic diversity and identify agronomically better greengram types. Two MSc students will be trained on the project at the Faculty of Agriculture Makerere University. Key words: Germplasm characterisation, graduate training, value chain analysis, Vigna radiata Résumé Ce projet cherche des options pour améliorer la production du pois chiche vert et les directives pour le favoriser comme récolte pour la diversification du revenu et de la sécurité alimentaire en Ouganda. Le projet analysera le système de chaine de valeur du pois chiche vert, identifiera les contraintes principales dans la production, la consommation et la commercialisation comme perçu par les agriculteurs et d'autres personnes intéressées et tracera une voie pour la recherche dans le champ et sur station du pois chiche en Ouganda. Le matériel génétique du pois chiche (sauvage, intermédiaire et cultivé) sera assemblé et caractérisé pour mesurer la diversité génétique et pour identifier agronomiquement de meilleurs types du pois chiche. Deux étudiants de MSC seront formés au cours de ce projet à la faculté d'agronomie de l'université Makerere. Mots clés: La caractérisation du matériel génétique, formation universitaire, analyse de chaine de valeur, Vigna radiate

Background	Greengram ( <i>Vigna radiata</i> (L.) Wilczek) is an important subsistence crop for food and income security, and sustainability of cropping systems (Jood <i>et al.</i> , 1989). However, in Uganda, its yields are very low and acreage is declining. This partly, is because there is lack of adequate technologies and technical advice to support greengram production and accentuate its development and wide adoption, as mainstream national agricultural research and development (R&D) systems have not targeted greengram. It is possible to elevate greengram in Uganda to the status of elite legume crops, such as beans and cowpea, if factors limiting its production are addressed. For instance, there is a paucity of information on greengram production with regard to suitable cropping systems; varietal diversity and suitability; profile of pests and diseases affecting the crop and their seasonal occurrence; and its role in household food security and income generation. This project will generate information and technologies to address some of the above aspects.
Literature Summary	Greengrams is an annual food legume belonging to the subgenus <i>Ceratotropis</i> in the genus <i>Vigna</i> . The genus <i>Vigna</i> , together with the closely related genus <i>Phaseolus</i> , forms a complex taxonomic group termed the <i>Phaseolus-Vigna</i> complex. It is an important subsistence crop in many developing countries where it is grown for its seeds and pods which are a good source of vitamins, minerals, starch and fibre and proteins (Jood <i>et al.</i> , 1989). Its ability to fix atmospheric nitrogen or when used as a green manure crop, short duration (maturity period of $55 - 70$ days), low input and minimum care requirement, and drought tolerance makes it suitable for incorporation into different cropping systems (Subbarao <i>et al.</i> , 1995), and it is a very useful forage for livestock. In most cases, when greengram is grown in the same season with right combinations of production factors (weather conditions, soils, cultural practices and variety), it out yields cowpea and velvet beans (Purseglove, 1988).
	In Uganda, greengram is grown under subsistence low input farming systems, particularly in northern, northeastern and eastern regions where it forms an important part of the diets and income source of the people (Rubaihayo, 1978). Despite its importance, there is a very wide gap between yields of landraces at farmers' fields, estimated at $300 - 500$ kg/ha (Mbowe <i>et al.</i> , 1987) and the potential yield of the improved cultivars at research stations, estimated at $3000$ kg/ha (Easdown, 1991). Where researched, this low yield is attributed to several

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	constraints including inherent variety failures (indeterminate growth habits, late and non-synchronized pod maturity, susceptibility to lodging, and pod shattering); the narrow adaptability to abiotic stress especially drought stress and losses due to pests and diseases (AVRDC, 2002), but it is not clear which of these constraints account for the low productivity and subsequent farmer apathy in Uganda.
Study Description	The project, lasting 30 months, will be implemented by Makerere University in collaboration with National Semi-Arid Agricultural Research Institute, Serere. It will involve training 2 M.Sc. students registered in the Faculty of Agriculture at Makerere University and farmers in eastern and northern Uganda. A diagnostic survey will be conducted to analyse the greengram value chain and understand the prospects and constraints to sustainable greengram production, utilisation and marketing. Documentation will be done on exisiting greengram production practices and cropping systems. Appropriate greengram producing areas and communities in Uganda where on-farm R&D interventions may be undertaken will be identified. The information obtained in the survey will be fed back to a selection of farmers and stakeholders so as to collectively prioritise interventions. Germplasm (wild, intermediate and cultivated) will be gathered during the survey and germplasm from World Vegetable Centre will be introduced. These will be assessed for genetic diversity using DNA finger printing techniques and agronomic performance. Farmers will be involved in a participatory variety selection by assessing agronomic trials as a stragety to involve them in testing elite greengram types based on their preferences.
Research Application	Implementation of this project will enhance collaborative research and training among institutions involved; and improve the capacity of Makerere University to participate in innovative training, research and outreach activities that can contribute to policy and development agenda and also contributing to the RUFORUM's strategic goals of enhancing smallholder productivity and increasing incomes of the poor. The information generated will guide the decision-making of smallholder farmers in adopting and/or increasing greengram production for crop diversification, improved nutrition, food and income security, as well as mapping a direction for on-farm and on-station greengram research in Uganda.

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