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Agronomic Evaluation of the Cultivated Yam Bean (*Pachyrhizus* spp.) Germplasm under West African Conditions

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Abstract

The yam bean is a legume root crop usually known as a vegetable crop. Three cultivated species are distinguished: Amazonian yam bean (*Pachyrhizus tuberosus*), Mexican yam bean (*P. erosus*) and Andean yam bean (*P. ahipa*), but interspecific hybrids are fertile and vigorous. The crop might have the potential to be used like soybean and cassava. The 1000-seed weight is high (from 180 to 230 g), seeds have a high protein (26 to 32 %) and oil (22 to 26 %) content with about 20 % carbohydrates of seed weight. However, for consumption the compound rotenone (about 1 % seed weight) has to be extracted or destroyed. Tubers are characterized by high moisture content (usually about 80 % of fresh tuber weight), but Chuin types of *P. tuberosus* have a low moisture content (about 70 %) and are used like cassava. The tuber includes starch as the main component and has a high protein content (8 to 18 % of dry matter). Agronomical data for the yam bean is limited. 34 accession were grown in Benin at two locations - one under drought stress conditions - with and without pruning of reproductive parts. The average tuber yield over both locations ranged from 6 to 45 t ha^{-1}, 21 to 81 t ha^{-1} and 10 to 38 t ha^{-1} for the Amazonian, Mexican and Andean yam bean, respectively. In a combined utilization of tubers and seeds tuber yield ranged from 5 to 29 t ha^{-1}, 10 to 49 t ha^{-1}, 6 to 27 t ha^{-1} and seed yield from 1.5 to 2.9 t ha^{-1}, 3.5 to 4.6 t ha^{-1} and 2.6 to 2.7 t ha^{-1} for the Amazonian, Mexican and Andean yam bean, respectively. The tuber dry matter content ranged from 18 % to 36 % of fresh tuber weight with 8 to 14 % raw protein content on dry matter basis. From all species tubers were processed to 'gari' after traditional starch extraction. Moreover, accessions could be made available by CIP Lima/Peru and can be freely distributed from country to country. In conclusion attractive yam beans could be identified for West Africa.

Keywords: 'Gari' processing, agronomical evaluation, Amazonian yam bean, Andean yam bean, legume root crops, Mexican yam bean, neglected crops, *Pachyrhizus*

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