

Performance testing of potato varieties



Performance of several potato varieties in the tropical highlands of West Java

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Executive summary

In the framework of the BOCI-project 'Sustainable potato production in Indonesia' (BO-10-001-230) trials were performed in West Java. The purpose was to evaluate the agricultural performance and processing quality of 10 varieties, half of which were introduced from the Netherlands by a Dutch seed potato company. The trials were performed by the Indonesian Vegetable Research Institute (IVEGRI) at two locations: the experimental farm of IVEGRI in Lembang (1250 m a.s.l.) and at a farmer's field in Pangalengan (1300 m a.s.l.). Each trial consisted of three replications in a randomised design and each individual plot contained 50 plants. Agronomic observations were made throughout the growing season; yield was measured using various parameters and the suitability for chips (crisps) and French fries production was established directly after harvest and after two months of storage.

The Dutch varieties were of different market types: specific chips varieties, dual purpose varieties (French fry and table) and a French fry variety.

The local varieties included local standard Atlantic, a chips variety, Granola which is a table potato and the dominant variety of Indonesia covering an estimated 90 % of the potato growing area. The other varieties were released by IVEGRI or are breeding selections.

Agronomy

The trials were performed during the rainy season of July-October 2012. Because of shortage of planting material for certain varieties the trial in Pangalengan contained only 4 of the 5 Dutch varieties as well as some other Indonesian varieties. Total tuber yields of the Dutch varieties and the 'local' variety Granola were similar, the others performed significantly less, including the processing potato variety Atlantic. The Dutch varieties showed a much larger plant height and more rapid ground covering, which in part may be due to the advanced physiological stage of the planting stock.

The Dutch seed potatoes had been stored (unconditioned) in Jakarta at temperatures of up to 30-35 °C for a number of weeks due to quarantine inspection and after that at ambient temperatures in the potato storage at IVEGRI (temperatures between 15 and 25 °C). At planting the potatoes were sprouting heavily, which gave them a head start compared to the local varieties, but weakened the seed tubers due to water loss and more advanced physiological aging.

The results of the two sites were quite similar, resulting in a similar ranking of the varieties with regard to yield.

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Testing for processing suitability

The experiments were carried out using standard protocols and potatoes from the harvest of the Lembang trial. Testing was done in the laboratory of IVEGRI and carried out twice: directly after harvest and after two months of storage under ambient conditions.

All varieties were subjected to both French fry testing as well as chips testing. The Dutch varieties were of different market types. Two were specific chips varieties; two were so-called dual purpose varieties, both fit for French fries and table, and one was a specific French fry variety. Of the Indonesian varieties Granola and several others were table potatoes. Atlantic is a specific chips variety.

In terms of the suitability for potato chips, all imported varieties had similar chips scores i.e. 8 at harvest. Two of them, had higher chips scores (9) after 2 months of storage, indicating a better suitability for chips manufacturing.

In terms of the suitability for French fries, two imported varieties showed consistent results at harvest and at two months after harvest, meaning that these two varieties were most suitable for French fry production in Java.

* The full report (42 pp.) is available for staff of the Ministry of Economic Affairs upon request