

Category	: International Rice Research Conference
Select Theme	: Genetic improvement
Endorsement email	:
Keyword 1	: Genetic gain
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Title of Entry	: Genetic gains in grain yield of rice varieties released in sub-Saharan African countries
Presenting author	: Kazuki Saito
Presenting author email	: k.saito@cgiar.org
Co author 1	: Elke Vandamme
Co author 2	: Ibnou Dieng
Affiliation presenting author	: Africa Rice Center
Affiliation 1	: Africa Rice Center
Affiliation 2	: Africa Rice Center
Select only one type of presentation	: 15 minute oral presentation
Abstract	: While there have been numerous studies on genetic gains in rice yield in Asia and Latin America, such information is scarce in sub-Saharan Africa. The objective of this study was to assess the trend in grain yield and its associated traits of rice varieties released during the last decades in Burkina Faso (irrigated lowland), Côte d'Ivoire (rainfed upland), Madagascar (irrigated lowland/rainfed lowland/upland), Mali (irrigated lowland), Nigeria (rainfed lowland/rainfed upland), Tanzania (irrigated lowland) and Senegal (irrigated lowland). In Benin (irrigated lowland/rainfed upland), we compared recently developed/introduced varieties including unreleased ones with popular varieties. In each country, 8 to 24 varieties were grown during one to four consecutive seasons. IR 64 and NERICA L-19 were used as common checks in 5 countries. Traditional varieties were included in upland trials in Benin and Côte d'Ivoire. Except for some trials, varieties were grown under two treatments, where the treatment included irrigated and rainfed conditions in rainfed rice production systems, whereas fertilizer application management practices and/or crop establishment methods were included in irrigated production system. Correlation analysis between yield and crop duration, and year of release in irrigated rice production system showed that there was a negative relationship between these traits and the year of release in most cases, irrespective of treatments. In contrast, there was a positive relationship between rice grain yield and the year of release in rainfed lowland and upland rice production systems irrespective of treatments. High yielding lowland varieties released between 1986 and 2013 had around 20% higher yield than IR 64 and also tended to have longer crop duration. These results show that considerable genetic gains in rainfed rice production systems have been achieved, while little progress in genetic yield gain has been achieved for irrigated

lowland rice. The reasons behind low progress in genetic gains in irrigated rice production systems should be identified, but may be related to a shift of breeding objective from high yields to high grain quality (e.g. aroma), stress tolerance, and/or shortened crop duration.

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