Rice is a staple food in West Africa but farmers’ production does not satisfy consumption demands. Rice farmers’ yields are low contributing to a large yield variation between and within major production systems and climatic zones. The objectives of this study were to describe the distribution of rice yields and their variability in the three main rice production systems across the three main climatic zones in West Africa, and to identify potential yield-affecting factors. Surveys were conducted in 11 West African countries (22 sites; 1305 farmers’ fields) between 2012 and 2014 and findings were compared with those of previous surveys from the 1990s. Farmers’ agricultural practices were recorded through questionnaires. Fields’ soil samples were collected and yields measured at harvest. Soil texture, pH, organic carbon, total N and available P varied both between and within production systems with coefficient of variations ranging from 14 to 126%. Grain yields ranged from 0.3 to 8.0 Mg ha-1 with mean yields of 4.1 Mg ha-1 in irrigated lowlands (n=449), 2.0 Mg ha-1 in rainfed lowlands (n=569), and 1.5 Mg ha-1 in rainfed upland systems (n=287). Mean yields were highest in semi-arid zone with 3.5 Mg ha-1 (n=507), followed by 2.2 Mg ha-1 in the sub-humid (n=633) and 1.7 Mg ha-1 in the humid zone (n=165). Compared to the 1990s, mean yield gains were moderate in rainfed systems (+1% per annum over the last 20 years) and non-existent in irrigated systems. Regional rice production increases can primarily be ascribed to expansion of the cultivated area. Crop management practices differed both between and within productions systems. The yield variability was highest in lowland ecosystems and tended to be more in the semi-arid than in more humid zones. While differences in mean yields can mainly be ascribed to climatic factors, the large yield variability was related to differences in crop management practices. A site and system-specific targeting of appropriate crop management strategies is seen to contribute substantially to reduce the rice yield variability in leveling up on-farm yields in order to enhance regional rice production.