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Integrated control of cassava bacterial blight: transfer of research results to NARS in Africa and adaptation of control measures to specific agro-ecological conditions

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Results of a collaborative EU-financed project, a follow-up of a BMZ-financed research project at the International Institute of Tropical Agriculture (IITA) (1994-1999), with the partners listed above - the German institutes being the coordinators - are presented. In field studies conducted by national agricultural research systems (NARS) in Benin and Togo, control measures for cassava bacterial blight, elaborated in a former project at IITA, such as intercropping, use of resistant varieties, weed control etc. were combined and tested under various agronomic and ecological conditions.

The investigations resulted in up-to-date survey data on major cassava diseases in Togo – data from other West African countries had formerly been collected at IITA -, the identification of locally and regionally well adapted control measures, using locally preferred, resistant varieties, intercropping with locally used crops, soil amendments with available material, fertilization, and recommendations on sanitary measures to reduce the disease. Local varieties had been planted in multi-locational trials in various ecozones under inoculation with local, virulent strains as well as challenged by a set of highly virulent strains from various geographic origin under glasshouse conditions.

Research results of European partners were partly verified under African conditions, such as testing of the cassava genome mapping population for reaction towards African strains in order to identify genetic markers and/or resistance related genes. Pathotypes of African strains were identified, leading to a differential reaction of genotypes of the mapping population. Detailed inoculation studies and the quantifications of bacterial population dynamics *in planta* indicated the occurrence of resistance mechanisms in leaves and stems, as well as genotypes expressing resistances on both or only on one level. Complementary studies by the European partners and of African guests at European laboratories elucidated some mechanisms of resistance, on biochemical as well as molecular genetic level, and molecular host-pathogen interactions. Wax analysis revealed an indication of a possible role of leaf surface waxes in resistance. New methods for detection of *Xanthomonas campestris* pv. *manihotis* (*Xcm*), using immunological and genetic techniques, were developed.

During exchange visits African scientists used techniques elaborated by the European partners, to study specific problems such as (a) primary infection of cassava cuttings by diverse microscopic techniques, (b) vector transmission of *Xcm*, using antiserum specific for lipopolysaccharides of *Xcm*. Specific molecular detection methods were elaborated and are being transferred to Africa.

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