

Bean Improvement for Low Soil Fertility Adaptation in Eastern and Central Africa

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Abstract:

Low soil fertility is one of the most important common bean (*Phaseolus vulgaris* L) productivity yield limiting factors in Eastern and Central Africa and cause substantial production losses. As a component of integrated soil fertility management strategy, a collaborative research was initiated to screen bean germplasms for their tolerance to the important edaphic stresses of the region, namely soil acidity, low available phosphorus and low nitrogen. A set of 300 breeding lines of major market classes and ecotypes were evaluated at varying ecologies under moderate and non-stress conditions at different locations in five countries. Bean genotypes evaluated vary considerably in their yield under stress conditions. Several lines identified tolerant to individual stresses and gave yield advantage over previously selected tolerant varieties. A few lines, BZ12894-C-1, AND932-A-1, DRK137-1, Nm12806-2A were tolerant to all three stresses, while ARA8-B-1, AFR709-1, AFR703-1 and AND1055-1 are tolerant to low P and low pH, and RWK 10, ARA 8-5-1, and T 842-6F11-6A-1 tolerant to low N and low pH. It is concluded that bean genotypes with multiple tolerance to edaphic stresses will make it possible to improve bean yield on low fertility soils common on small scale farmers' fields generally characterized by a complex constraints rather than a single stress.