A field study was carried out on a six-year-old on-farm field trial during long-rains season (Aprilï August) 2003 to investigate the effect of improved fallow systems and phosphorus application on arbuscular mycorrhiza fungi (AMF) symbiosis in maize. The trial comprised of maize rotated with a fast growing leguminous Crotalaria grahamiana fallow and a non-leguminous Tithonia diversifolia fallow for 3 years followed by continuous maize. The experiment was randomized complete block design with three cropping (continuous maize, Crotalaria fallow and Tithonia fallow) systems and two phosphorus levels (0 and 50 kg P/ha). AMF colonization in maize roots, maize yield and macro-nutrients uptake were recorded. Phosphorus applications improved ($P < 0.05$) early (<8 weeks old maize) AMF colonization, nutrient uptake and maize yield in improved fallow systems. Greater differences due to phosphorus application were noted in maize in Tithonia fallow than in Crotalaria fallow. Following phosphorus application, a positive relationship existed between early AMF colonization and maize yield ($r = 0.38$), and phosphorus and nitrogen uptake ($r = 0.40$ and $r = 0.43$, respectively), demonstrating the importance of phosphorus fertilization in enhancing low-input technologies (improved fallows systems) in phosphorus deficient and acidic soils of western Kenya.