

Abstract

Whitbread, AM; Robertson, MJ; Carberry, PS; Dimes, JP (2010). How farming systems simulation can aid the development of more sustainable smallholder farming systems in southern Africa. *Europ. J. Agronomy* 32 (2010) 51–58

Over the past 20 years, farming systems modelling has become an accessible tool for developing intervention strategies targeted at smallholder farmers in southern Africa. Applying the Agricultural Production Systems sIMulator (APSIM) to credibly simulate key soil and crop processes in highly constrained, low yielding maize/legume systems has led to four distinct modes of use: (i) to add value to field experimentation and demonstration; (ii) in direct engagement with farmers; (iii) to explore key system constraints and opportunities with researchers and extension agencies; and (iv) in the generation of information for policy makers, bankers and insurance institutions. Examples of application in each of these modes are presented. Despite being demonstrated as an excellent tool for developing intervention strategies and extension material, the use of simulation is limited by a lack of competent local users. Better co-operation within the simulation community, sharing of climate, soil and crop parameterisation and validation datasets, and focussing of efforts on using models to benefit smallholder farmers are suggested as ways of increasing the use and relevance of simulation. Substantial investment in the training of agriculturalists and the further science development of systems simulation is required to tackle the enormous challenges facing agricultural development in the region.