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Preface: Chinese Conservation Tillage

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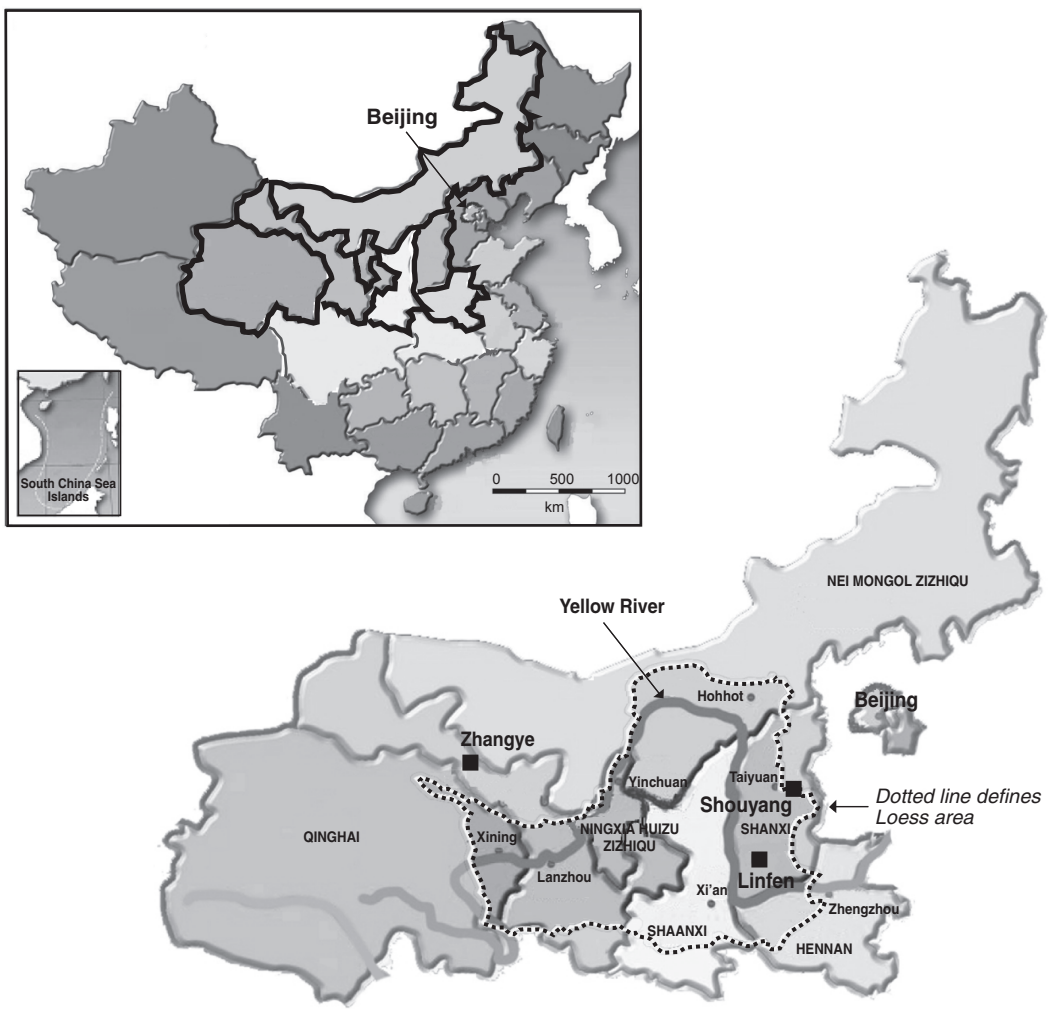
Papers in this special section focus on the results of ACIAR-funded projects concerned with more sustainable dryland grain production on the loess plateau of China. The loess soil area extends across a large area of northern China, and its products feed a significant proportion of China's population. Soil erosion is a major problem under traditional tillage production systems, well illustrated by the colour of eroded loess and the English-language label "Yellow River".

The Conservation Tillage Research Centre of China Agricultural University has been involved in this work for many years, in partnership with the Agricultural Machinery Bureau (mechanisation extension service) of Shanxi province, but the work was enhanced from 1992 onwards in co-operation with University of Queensland. The farming systems of Queensland and northern China operate at vastly different scales of farm size and mechanisation level, but they have



China's Northwest Provinces, and the Loess Plateau Area (dashed line). Research sites marked by squares – Zhangye, Shouyang, Linfen.

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common problems of inadequate and unreliable rainfall, high levels of soil degradation and a declining rural population.

The project personnel mix—Chinese and Australian academics, together with Chinese extension staff focused on field performance—worked effectively to develop zero tillage planters for small-scale farming, and on the design and execution of field experiments. The project established complimentary experiments in China and Australia to assess the interaction of crop residue, wheel traffic-induced soil compaction and tillage. Demonstration areas, operated by local farmers in co-operation with the extension service, were used to ensure community interest and involvement in China.

Results from this project have demonstrated that the principles underlying greater sustainability of dryland grain production are remarkably similar despite the differences in environment. They can be summarised in the ideas of maximising crop residue protection of the soil surface, minimising soil compaction, and minimising tillage. The results also illustrated the broader 'system' significance of controlling field traffic in both China and Australia, one outcome of which has been the ongoing ACIAR work in Gansu province using minimum-tillage, Permanent Raised Bed cropping systems.

The project has shown that conservation technology can be applied successfully on small farms with small-scale equipment, and this has been the basis of large-scale adoption across northern China, under an extension program set up by the Ministry of Agriculture in 2002. On-farm change has also occurred in Australia, with the increasing adoption of controlled traffic farming. In both environments, the outcomes of better practice not only reduce the environmental impact of cropping, but also improve productivity and economic sustainability.

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