

Figure 15 Inter-annual and average monthly variation of groundwater level in Gaocheng County, on the North China Plain, during 1974–2001

The model can simulate, in daily steps, wheat phenological development from planting through to germination, maturity and harvest; photosynthesis and plant growth; carbon allocation to the root, stem, leaf, and grains; and soil water and nutrient movement. To test the validity of the model in the study region, experimental data from the 2000–2001 wheat-growing seasons were used. Comparisons of the simulation results and the measured results are shown in Table 2 and in Figure 16. They indicate that the model simulation is acceptable in the study region for winter wheat management.

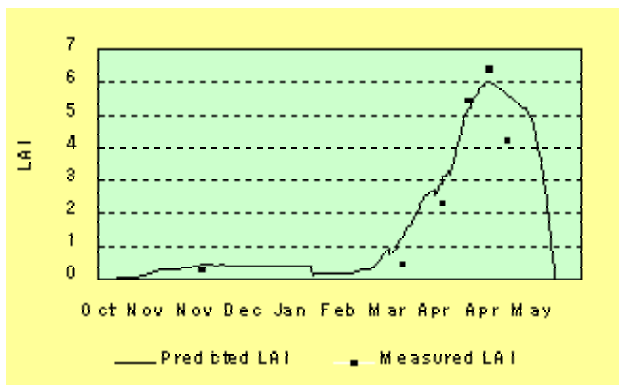


Figure 16 Measured and simulated leaf area index (LAI) of wheat in Gaocheng County, China

Table 2 Comparison of simulated results from adjusted DSSAT wheat model with measured data, Gaocheng County, China

Factor	Simulation	Measurement
Yield (kg/ha)	6608	6330
Weight per grain (g)	0.029	0.029
Grain number (grain/m ²)	22488	21828
Grains per ear	38	38
Maximum leaf are index	6.1	6.4

The simulation results indicate that this model is a strong tool to determine the wise use of ecological goods and services such as freshwater resources (irrigation) for crop production. It can provide information on the amount and timing of irrigation to produce the highest crop yield. For example, it was examined that the best timing of irrigation with same amount of water resource between single time and twice time (Fig.17). According to the simulation, the highest yield was achieved by single time irrigation on May 1, and by twice time divided irrigation on April 10 and May 1, which is more efficient than single time irrigation. Finally, through scientific irrigation scheduling, water use efficiency could be improved and irrigation water can be possibly saved with high wheat yield.

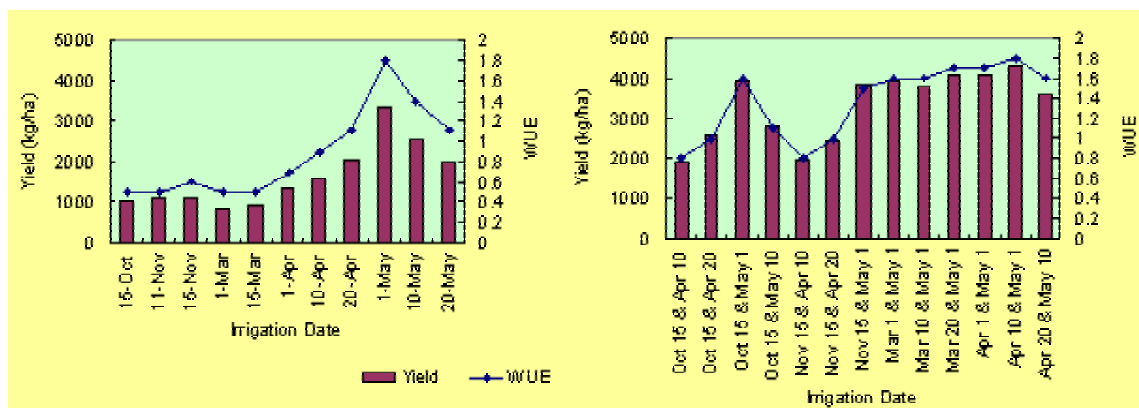


Figure 17 Results of DSSAT model simulation of wheat yield and water use efficiency with one or two irrigations in Gaocheng County, China

2.5 Capacity-Building and Networking

To disseminate information on IEM, two international meetings – in Beijing and Tokyo – were organized in 2002. One was the APEIS Capacity-Building Workshop on Integrated Environmental Monitoring in the Asia-Pacific Region, held on 20–21 September 2002 in Beijing. About 50 representatives from 10 countries attended this meeting, and experts from some famous international organizations, such as NASA, APN, and CSIRO, participated and presented papers. The other meeting was the Workshop on Sustainable Environmental Management of Catchment Ecosystems in the Asia-Pacific Region, held on 25–26 November 2002 at the United Nations University in Tokyo. This workshop was jointly organized by the IEM sub-project and the MA sub-global assessment project of China. To promote cooperation between members of different countries, an APEIS Capacity-Building Workshop is scheduled to be held in Australia in October 2003. Meanwhile, the outcomes of IEM products will be published in international journals and newspapers and on Internet sites.