

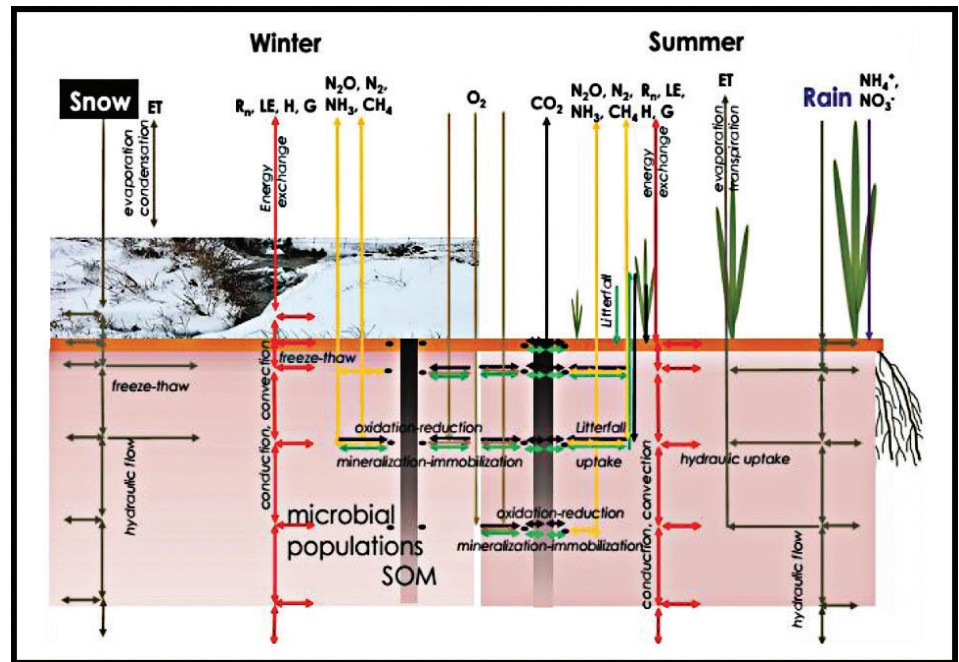
# Investment Insight

## Recent Research Results

### Looking at the big picture of cover crops to improve agroecosystems

Today's agriculture requires efficient, profitable and sustainable production practices – all closely interconnected to reach the goals of environmental responsibility. Dr. Kaiyu Guan and Yang Qu of the University of Illinois are assessing cover crops at the regional scale for Illinois.

Together they are using ECOSYS to simulate nitrogen and carbon fluxes and energy exchanges. ECOSYS is one of the few ecosystem models that has detailed processes in terms of physical and chemical theories, and also incorporates major farming practices such as tillage, irrigation, and tile-drainage system. They are making use of the NCSA (National Center for Supercomputing Applications) Blue Waters Supercomputers at



the University to code, compute, model, and output results.

So far, they have simulated well carbon and nitrogen dynamics and water balance in Midwest agroecosystems, specifically in the Corn Belt. Using their calibrated model, they are assessing the high-level effects of cover crops, including the benefits of cover crops and quantitative analysis of cover

crops effects on the reduction of nutrient loss. Results from simulation of the corn-soybean rotations demonstrate how the model could accurately simulate inter-annual variability of the agroecosystem, and can ultimately be used to assess the suitability of incorporating cover crops.

