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**附录1　农田土壤动物长期监测样地拟解决的科学问题(Box 1的英文对照)**

Appendix 1　Scientific questions to be solved in permanent plot of agricultural soil animal (corresponding English for Box 1)

**Basic theory**

I-1 What is the status of agricultural soil animal diversity in China? What are the characteristics of species, functional and genetic diversity of agricultural soil animal in China?

I-2 What are the temporal and spatial patterns of α, β and γ diversity of agricultural soil animal in China? What are the mechanisms that form and maintain these temporal and spatial patterns?

I-3 How does agricultural soil animal diversity interact with natural factor and human activity? Do the intense human activity in agriculture change the interaction between the soil animal diversity and the natural environment?

I-4 What are the temporal and spatial patterns of soil animal diversity in different agricultural areas in China? What are the factors and mechanisms that form and maintain the temporal and spatial patterns of soil animal diversity in different agricultural areas?

I-5 What is the relationship between soil animal diversity and the productivity and stability of agricultural ecosystem? What effect does soil animal diversity have on the productivity and stability of agricultural ecosystem?

I-6 What are the ecosystem functions of agricultural soil animal diversity? How does the ecosystem function of agricultural soil animal diversity dynamic change under the intense human activity?

I-7 What is the relationship between the soil animal and other taxa diversities (such as soil microorganism, vole, bird, pollinating insect, plant pest)? What are the internal connection and mechanisms between the cascading effect of soil animal and other taxa diversities and key ecosystem functions (such as crop yield, carbon sequestration)?

I-8 Under the background of global change, what is the matching degree of phenology between soil animal, crop, and other animals. What are the dynamic and mechanisms of the matching degree?

I-9 How has the diversity of soil animals changed during the history of agricultural development in China? Which species are sensitive to intense agricultural activities? Which species are adapted to intense agricultural activities?

I-10 What is the dynamic change in agriculture soil animal diversity in different agricultural areas in China? Which species and areas are the hot spots for protecting soil animal diversity?

I-11 Do human activities lead to the homogenization of agricultural soil animal diversity? Which agricultural areas have the most obvious homogenization? What are the countermeasures for the homogenization of agricultural soil animals from local to regional scale?

I-12 Under the current agricultural management model and possible future climate change scenarios, how will the diversity of agricultural soil animal change and response in China? How do agricultural soil animal change and response to different agricultural areas? How to efficiently monitor and predict the change and response?

I-13 What are the key ecosystem functions that soil animal diversity indicates the agricultural ecosystem health?

**Practical application**

II-1 Which practical activities can improve and maintain the diversity of agricultural soil animal? How to effectively help farmers and local relevant departments to improve and maintain the diversity of agricultural soil animal?

II-2 Which practical activities can maintain the stability, anti-interference and sustainability of agricultural soil animal diversity? How to help farmers and local relevant departments to maintain the stability, anti-interference and sustainability of the agricultural soil animal diversity?

II-3 Which practical activities can maintain and perform the functions of the agricultural soil animal diversity, such as maintaining high productivity, controlling pest, and maintaining ecological balance?

II-4 Which practical activities targeting on soil animal diversity can improve soil quality, maintain soil health and increase food production? How to achieve the mentioned goals through providing guidelines for practice activities?

II-5 What practical activities targeting on soil animal diversity can promote eco-agricultural tourism development, increase farmers' income and maintain rural stability?