



Transformation for sustainable nutrient supply and management

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trans4num Newsletter #4

In the previous issues we talked about the work carried out in the trans4num Europe project and we gave a more detailed description of the NBS sites, the experiments and the first year updates. You can check the past issues on our website - [trans4num newsletter](#).

In this issue of the trans4num newsletter we will continue describing the work of the trans4num project with the activities implemented by our partners in China.

About trans4num China

The ambition of trans4num China is to explore new models of agricultural sustainability and transformation that can be used as references worldwide. This involves learning from the European Union's experience with Nature-based Solutions (NBS) for nutrient management and adapting those solutions to the specific context of China.

The project aims to achieve the following:

- Develop a roadmap for sustainable agricultural development and transformation.
- Promote the widespread use of NBS nutrient management strategies in China and other countries.
- Foster communication and collaboration between scientists and PhD students.

The project is focusing on three **agroecological zones in China**: **Northeast** (Inner Mongolia), **North China Plain** (Henan/Hebei), and **Southwest** (Chongqing). Each zone has its own unique set of challenges and opportunities for implementing NBS.

The collaboration between the EU and China is crucial for sharing knowledge, best practices, and research findings to accelerate the adoption of NBS and promote a more sustainable and resilient global food system.

trans4num China consortium

The **trans4num China** consortium brings together 8 partners, and together with the European consortium, the project has a well-balanced transdisciplinary team with complementary expertise ranging from biophysical agronomic to socio economic disciplines



trans4num partners in China

Chinese Consortium

trans4num China NBS sites

The trans4num project, which aims to develop sustainable nutrient management practices in agriculture, is conducting experiments across three sites in China.



Chongqing
Southwest China
organic fertiliser amendment



Henan Province
North China Plain
straw treatment



Inner Mongolia
Northeast China
soybean



1) North China Plain

Challenge: This region faces a combination of environmental and agricultural challenges related to nutrient management, such as declining soil organic matter, deteriorating soil properties, and inefficient grain and soybean rotation practices.

Methods: Researchers are analysing mechanisms for efficient resource utilization and soil fertility enhancement, identifying key agronomic techniques for sustainable crop rotation, integrating biotechnology, light and simplified farming practices, and developing key technologies for improving grain and soybean rotation systems.

Focus: The project aims to develop a sustainable high-yield and high-efficiency grain and soybean production system. This trial is contributing to the development and integration of simplified soybean production technologies for Northeast China.

Trial: A trial commenced in 2023 in Zhalantun City, Inner Mongolia, comparing 5 farming methods: no tillage with rotation cropping, deep loosening biennially with rotation cropping, ploughing with rotation cropping, rotary tillage with rotation cropping, and rotary tillage with continuous cropping.

Results: Implementation of these technologies across 2,000 hectares resulted in an average yield increase of 10% and a 10% reduction in fertilizer use.



2) Southwest China

Experiment: Partial Organic Substitution for Chemical Fertilizer

Soil type: Purple soil (88% sand, 5% silt, 7% clay)

Crops: Chili-cabbage rotation system.

Treatments: Organic waste applications such as biochar, chicken manure, kitchen waste, and straw.

Focus: Evaluating the effects of treatments on soil aggregate stability and carbon dynamics.

Preliminary Results (2023): Partial organic substitution (POS) improved aggregate organic carbon stability (AOCS). Biochar was particularly effective, significantly increasing organic carbon content across soil aggregates. Biochar demonstrated marked improvements in aggregate stability, soil organic carbon (SOC), and recalcitrant carbon content compared to straw. Straw had a lesser impact due to increased microbial respiration and carbon degradation.



3) Northeast China

Challenge: Low utilization of straw resources and poor soil fertility in the region.

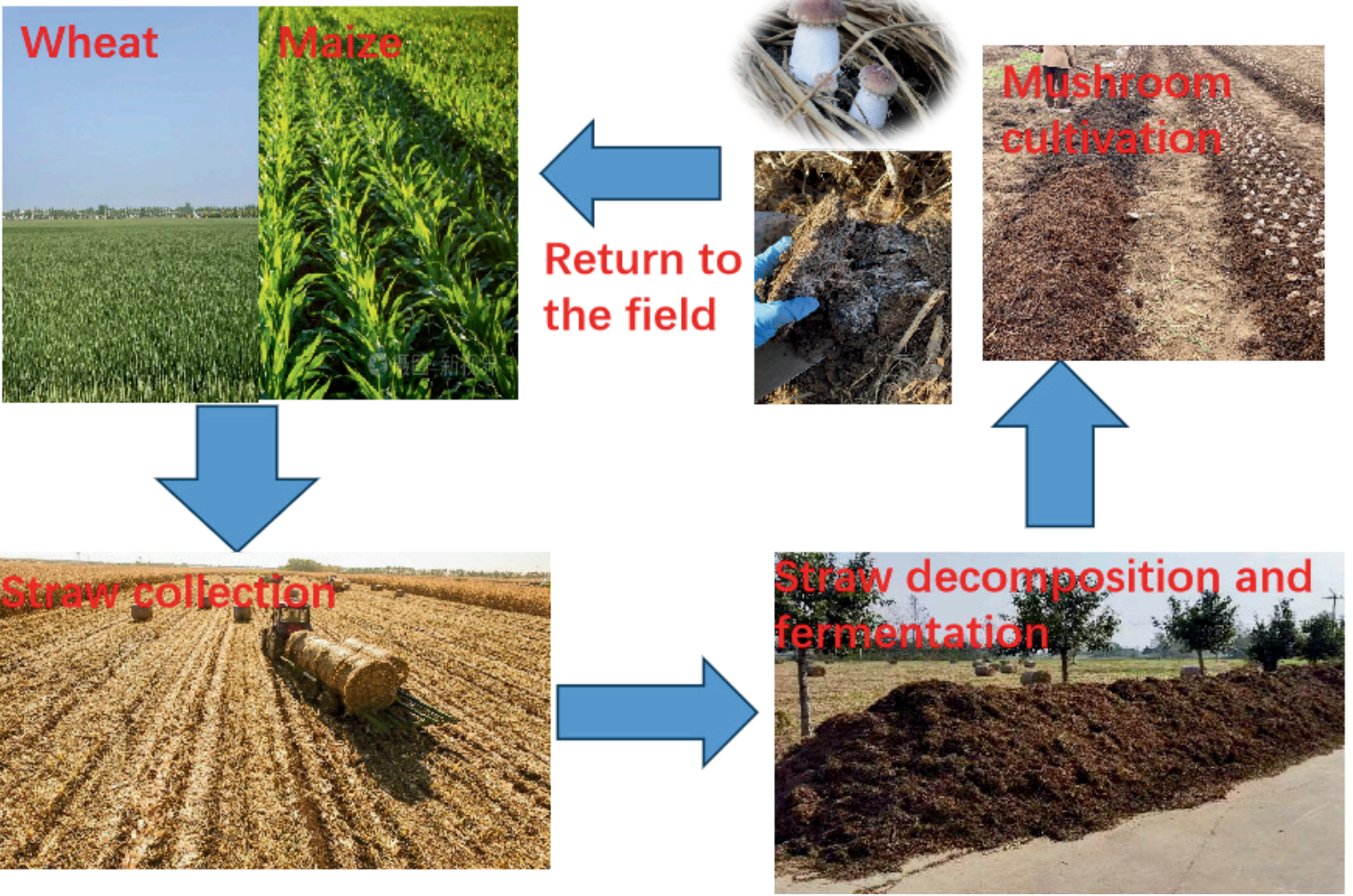
Solution: Development of a straw-dominated crop-mushroom rotation system.

Results: Significant improvements in crop yields and soil health.

- Wheat yields increased by 23.5%.
- Soil organic matter increased by over 60%
- Available nutrients increased by over 40%
- Drastically reduced weed populations (over 90%)
- Significant economic benefits (up to 18,000 Euros per hectare)

Additional Focus: Optimizing mushroom cultivation and residue utilization technologies. Experimentation with different straw inputs and mushroom inoculation rates.

Optimal setup: 9 tons of straw and 200 kg of inoculant per 667 m² (maximizes yield and quality).



[Read more about the Chinese NBS sites](#)

trans4num EU and trans4num China

Both the EU and China recognize the importance of transforming their agricultural systems to achieve more sustainable nutrient management. This involves:

- **Balancing food security with environmental protection:** The need to increase food production while minimising environmental impacts is a shared challenge.
- **Promoting innovation and technology transfer:** Both regions are investing in research and development to improve nutrient use efficiency, reduce pollution, and enhance soil health.
- **Developing supportive policies and frameworks:** Policies and regulations play a vital role in incentivising sustainable practices, setting targets, and guiding the transition towards more sustainable nutrient management.
- **Fostering international collaboration:** Sharing knowledge, experiences, and best practices between the EU and China can accelerate progress in addressing nutrient management challenges.

trans4num library

This library presents all the documented results of the trans4num project at one place.



Deliverables



Videos



Publications



Practice abstracts



Communication materials



Online inventory

The project library offers access to a variety of materials that we invite you to discover. As the project progresses, we will add more information and resources so make sure to check back...

[Go to the library](#)

EU AND CHINA NEWS

01

Chinese consortium was approved



02

Project kick-off meeting in China



03

General Assembly in The UK



04

Sino-German conference



05

trans4num EU trip to trans4num China



[Go to the News](#)

Thank you for being part of our shared mission to transform nutrient supply and management for a sustainable future. In our next issue, we'll share exciting updates on the progress of each project activity, offering a closer look at the steps we're taking together. Until next time, stay curious and dedicated to sustainable progress!



Happy
holidays!

May this holiday season bring you moments of rest, joy, and inspiration, and may the new year open doors to continued collaboration and success.

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