

Progress and Outlook for Testing Soil of Formulated Fertilization in Hubei Province

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I. Development history of testing soil for formulated fertilization

1. The initial stage of elementary formulated fertilization(from 1983 to 1993)

◆ Full summary for the results of the second general survey of soil

- ◆ The identification for type, quantity, quality and distribution of the cultivated soil;**
- ◆ Preliminary identification of the soil obstacle factors that affect the agricultural production soil;**
- ◆ General nitrogen deficiency, severe phosphorus deficiency, local boron and zinc deficiency, potential potassium deficiency;**

I. Development history of testing soil for formulated fertilization

- **Full application for the results of the second general survey of soil, to first propose the implement formulated fertilization**
 - ◆ Give priority to nitrogen and phosphorus supported with the primary formulated fertilization;
 - ◆ Focus on qualitative diagnosis, supplemented by fix quantify (semi-quantify);
 - ◆ Fertilizer, compound fertilizer and organic fertilizer products are started to develop;
 - ◆ Establish an union of three or four compound fertilizer companies;
 - ◆ During decade, fertilizing amount has increased 40%, and the total output of crops increased 110%.

I. Development history of testing soil for formulated fertilization

2. Exploratory stage for optimum formulated fertilization (From 1994 to 2003)

- **Apply results of arable soil monitoring to explore optimization mode of formulated fertilization**
 - Fertility change: some are lack of nitrogen and phosphorus, with severe potassium deficiency, ordinary zinc and boron deficiency ; the lack of organic matter is more serious;
 - Plant crops due to soil, and apply fertilizer according to qualitative and quantitative methodologies (fix quantify is complied with fertilization quality);
 - Implement the rational application of organic fertilizer, NPK micro element fertilizer;
 - Limit the cooperation of agricultural enterprises to carry out experimental work of testing soil for formulated fertilization

I. Development history of testing soil for formulated fertilization

- **By integration of industry and commerce, farm, industry and commerce, we explore the integrated mode of "Testing, distribution, production, supply and fertilization", which can effectively promote the application of compound and mixed fertilizer**
 - **By World Bank loan and other projects, soil fertilization cause is carried out to build 41 testing soil for formulated fertilization stations; the annual production capacity of formula fertilization has reached 0.5 million tons;**
 - **Complex mixed fertilizer, commercial organic fertilizer, organic and inorganic fertilizer industries have developed rapidly; the production and sales increased exponentially;**
 - **Fertilizer new technologies and new products are improved, emerging in endlessly;**
 - **It has achieved the remarkable economic benefits, significant social and long-term environmental benefits.**

I. Development history of testing soil for formulated fertilization

- ◆ **On 15th June, 1999, the own handwriting of Wen Jiabao, the vice prime minister of the State Council was approved on the report about carrying out balanced fertilization:**

To promote scientific fertilization technology and guide farmers to scientifically, economically and rationally apply to fertilization, it is an important way to develop the high-yield, high-quality and high-efficiency agriculture, which can increase farmers' income, being focused as an important measure of agricultural scientific and technological revolution.

○

I. Development history of testing soil for formulated fertilization

3. Promotion stage of testing soil for formulated fertilization (from 2004 to 2013)



- The farmer named Zheng Xianghua from Zhijiang City of Hubei put forward the requirement for arable land of “Testing soil and applying fertilizer” to Premier Wen Jiabao on the farm;
- In 2005, the central government allocated 200 million Yuan to do subsidy funds on testing soil for formulated fertilization in 200 counties to start the implementation.

II. Work progress of testing soil for formulated fertilization

1. Expanding applied range to significantly improve the comprehensive benefits

- Supporting for national projects, the central financial fund of provincial accumulation has been invested 310 million Yuan, and the provincial special fund reached 92 million Yuan.
- By the universal implementation, the number of project counties has increased from 12 in 2005 to 107 in 2009.
- The usable area of testing soil for formulated fertilization increased from 20 million in 2005 to 95 at present, accounting for 73.4% of the total crop sown area in the whole province.
- The application rate of formulated fertilization in the whole province in the proportion of fertilizer total consumption (discount rate) increased from 19.4% in 2005 to 30.5% currently.
- Agricultural increased 6.4% in production, and the cumulative efficiency was 30.87 billion Yuan, which has achieved the remarkable social, economic and ecological benefits.

II. Work progress of testing soil for formulated fertilization

2. The test system has been continuously improved, and the service capabilities have been significantly enhanced

- **There are 107 projects in the province to build 101 perfect clay fertilizer laboratories;**
- **There are 58 "Double Certification" laboratories that have passed the provincial measurement;**
- **There are 18 standard control laboratories of Ministry of Agriculture, ranking the second in China;**
- **The timely, fast, accurate and lot sizing test.**

II. Work progress of testing soil for formulated fertilization

- 3. The technical system is being optimized and the level of application has been improved significantly.**
- **The number of technical personnel of the province has been increased from less than 700 of 2005 to 1,100 at present, and 509 personnel have the titles of middle and high rankings; 110 have the quality of formula;**
 - **To further understand the soil nutrient of cultivated land in the province;**
 - **To improve the target system for the main staple crop in the fertilizer recommendation;**
 - **To build the perfect database of testing soil for formulated fertilization.**

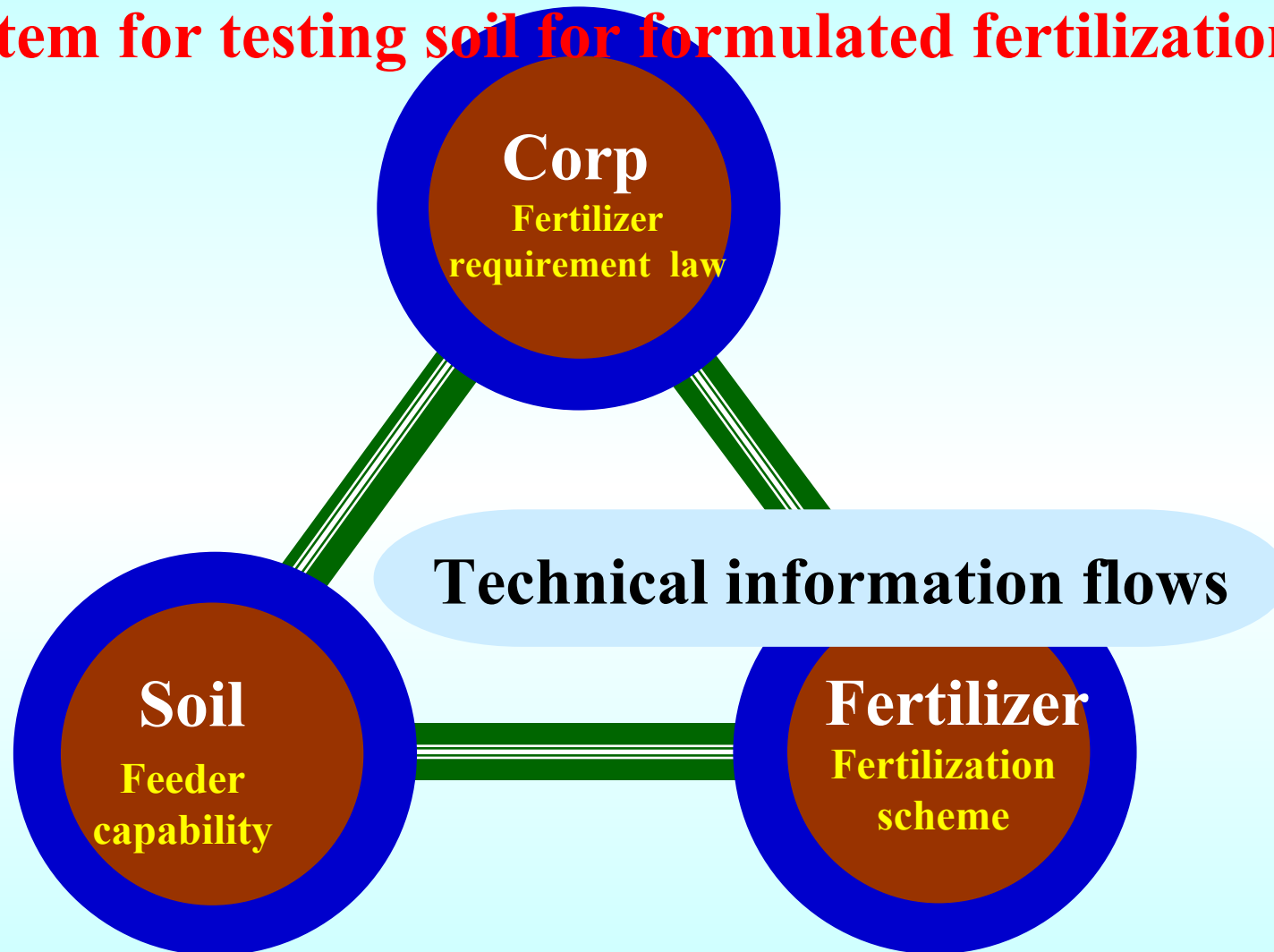
II. Work progress of testing soil for formulated fertilization

4. The fertilizer model is being continuously innovated, and the proportion of formula fertilizers is significantly increased.

- Taken the promotion of cooperative organization, mode base service, direct supply of the specialized enterprise supply, serves of agricultural technology and terminal formula fertilizer are promoted ;
- The formula fertilizers are cooperatively in agribusinesses and there are 70 processing enterprises identified formula fertilizer in province;
- 2 to 3 specialized enterprises are identified by open tendering in counties and cities, to generalize and identify the business formula fertilizers;
- Using micro-fertilizer machine, the personalized direct service for supplying fertilizer is carried out. There are 200 service stations for formula and supply in the village.
- The center for formula fertilizer is built in counties and cities; the special place and fertilizer supermarket are built in the village.

III. Prospects of testing soil for formulated fertilization

1. System for testing soil for formulated fertilization



III. Prospects of testing soil for formulated fertilization

◆ Fertilizer requirement law of crop



- **Production targets (High and stable yields)**
- **Quality aim (High quality and innocuousness)**
- **Benefit aim (High efficiency increment , Agriculture/ fertilizer ratio)**

III. Prospects of testing soil for formulated fertilization

◆ Soil capacity to supply fertilizer



- ◆ **Monitoring of soil fertility**
- ◆ **Soil test**
- ◆ **Improving fertilizer**

III. Prospects of testing soil for formulated fertilization

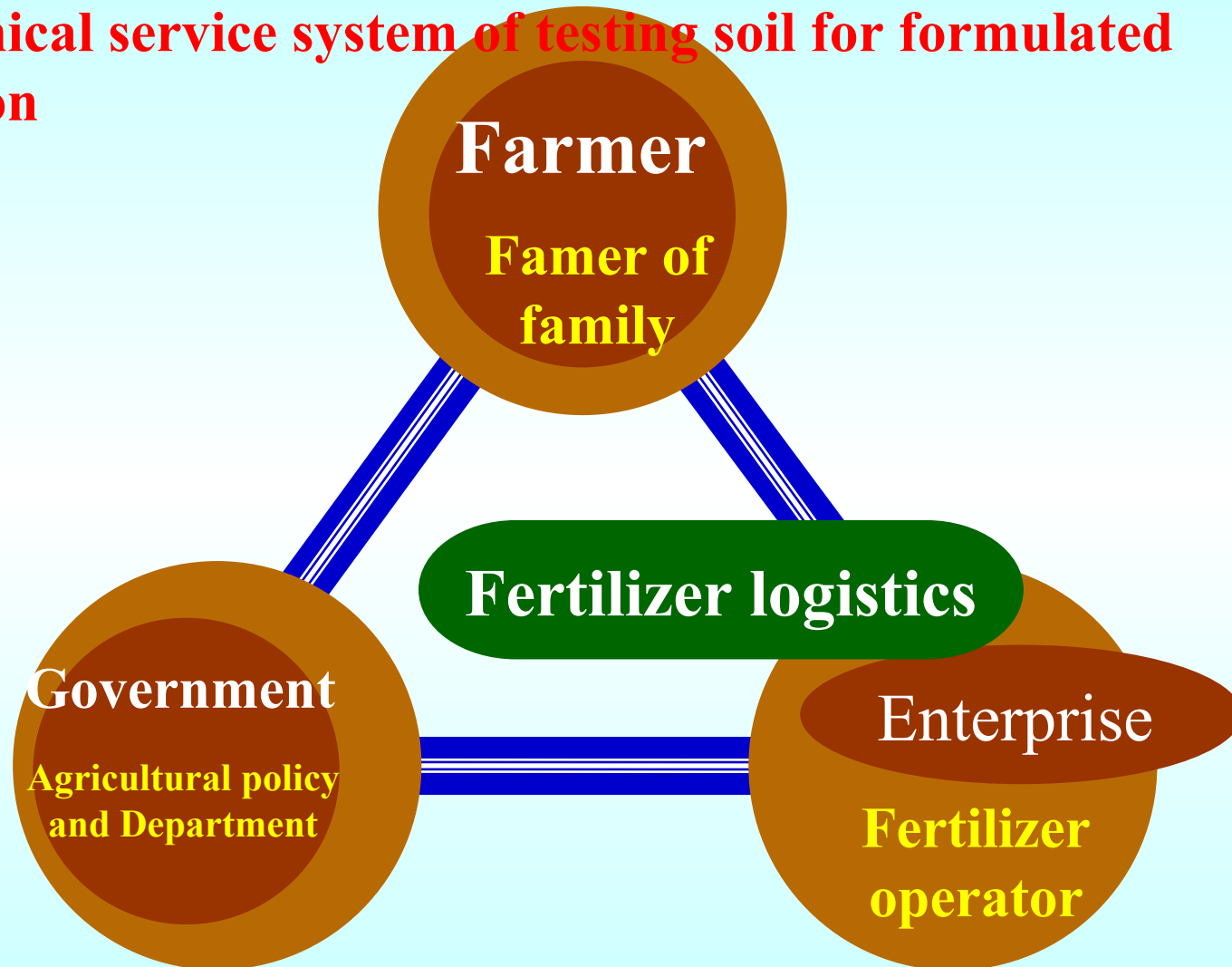
◆ Fertilizer application scheme



- ◆ **Fertilizer efficiency test**
- ◆ **Product research**
- ◆ **Fertilization formula**

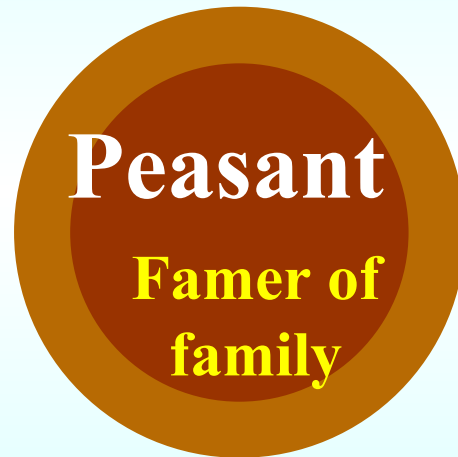
III. Prospects of testing soil for formulated fertilization

2. Agrochemical service system of testing soil for formulated fertilization



III. Prospects of testing soil for formulated fertilization

◆ Peasant—Famer of family



- ◆ **Using science and technology**
- ◆ **Scientific fertilization**
- ◆ **Maintenance for rights and interests**

III. Prospects of testing soil for formulated fertilization

Government Agricultural policy and Department



- ◆ Management responsibility
- ◆ **Policy orientation**
 - **Market maintenance**
- ◆ Service responsibility
 - **Soil testing and formula**
 - **Technical guidance**
 - **Industrial harmony**

III. Prospects of testing soil for formulated fertilization



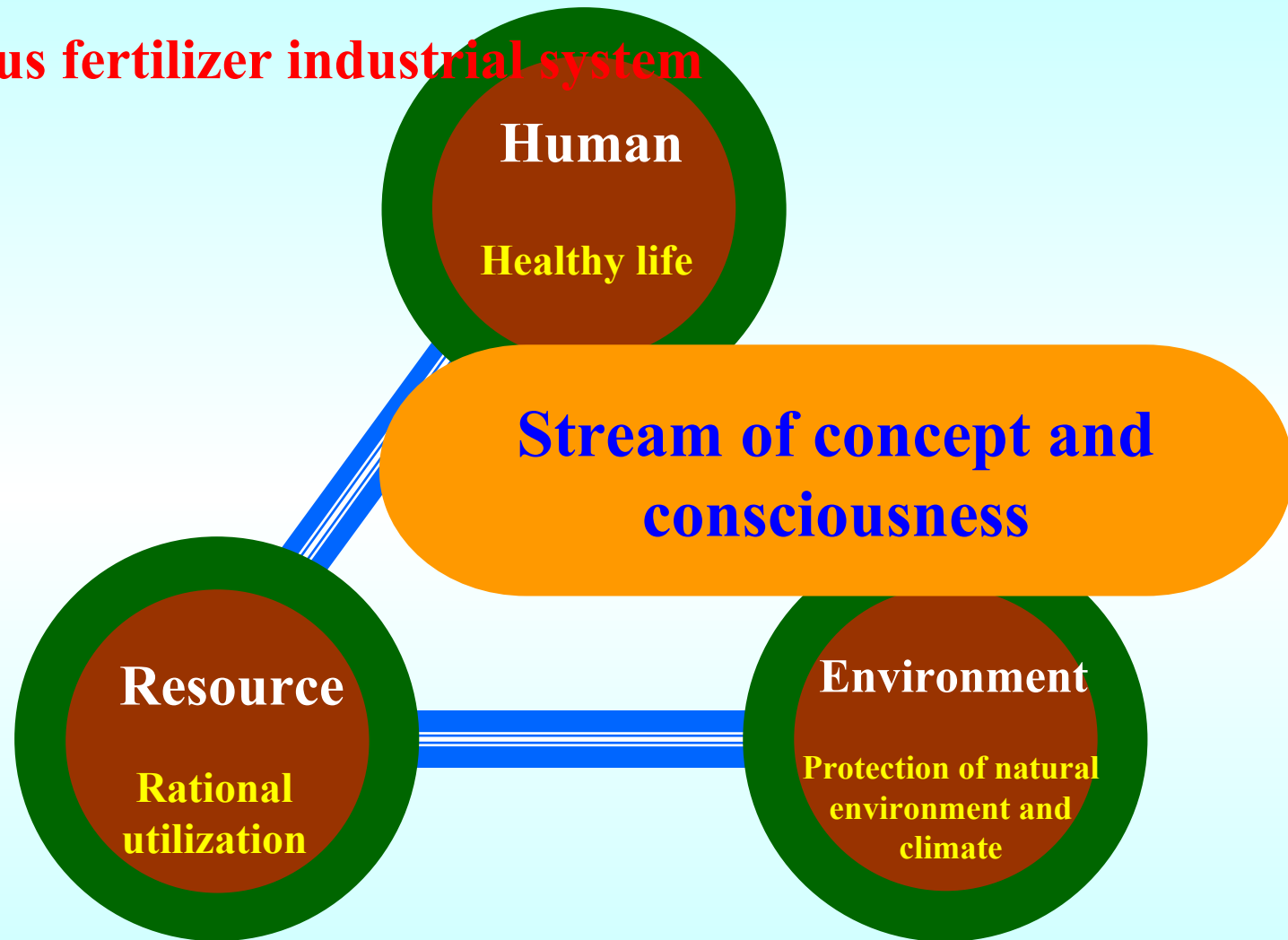
Enterprise—Fertilizer operator



- Produce and supply fertilization
- Materialization technology
- Supporting service

III. Prospects of testing soil for formulated fertilization

3. Harmonious fertilizer industrial system



III. Prospects of testing soil for formulated fertilization

◆ Human healthy life



- ◆ Food safety (Quantity and quality)
- ◆ Nutrition and reason (Green and pollution-free)
- ◆ Comfortable life (Water and atmospheric environment)

III. Prospects of testing soil for formulated fertilization

◆ Rational utilization of resource



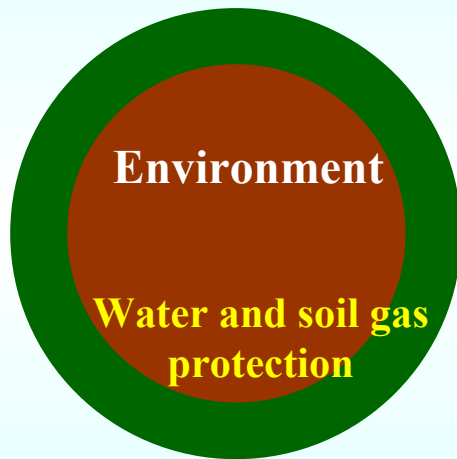
◆ **Efficient utilization**

◆ **Economical utilization**

◆ **Alternative pathway**

III. Prospects of testing soil for formulated fertilization

◆ Water and soil protection atmosphere



- ◆ Water eutrophication
- ◆ Degeneration of soil fertility
 - Acidification
 - Poison
 - Impoverishment
- ◆ Greenhouse gases (soil/gas carbon value ratio)

A photograph of a large, dense green tree in a park-like setting. The tree is the central focus, with its thick trunk and lush foliage. In the background, there are other trees with autumn-colored leaves, a paved path, and a building. The text "Thank you!" is overlaid in a large, red, serif font across the middle of the image. The ground is covered in green grass with some fallen leaves. There are several small, black and white striped markers in the foreground.

Thank you!