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The Building of Grass-roots Agricultural Technology Extension System

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Abstract Based on the survey of 154 farmers in Guiyang City, we analyze the basic situation of building of grass-roots agricultural technology extension system in Guiyang City. Then we point out some problems in the building of grass-roots agricultural technology extension system in Guiyang City: the function of grass-roots agricultural technology extension center weakens; the content of agricultural technology extension is difficult to adapt to farmers' needs for technology; the extension mode of agricultural technology departments does not adapt to the needs of modern agriculture. In order to perfect the building of grass-roots agricultural technology extension system, the countermeasures and recommendations are put forth as follows: strengthening the input of funds, and ensuring that the basic work of public welfare agricultural technology extension is smoothly carried out; innovating upon the system, and improving the function of grass-roots agricultural technology extension center; implementing management on agricultural technology extension personnel's performance, and promoting the extension efficiency; strengthening the building of extension team in rural areas, and cultivating high-quality agricultural technology extension personnel; exploring the advanced service mode to meet farmers' needs.

Key words Grass roots, Agricultural technology extension, Building, Guiyang City

The grass-roots agricultural technology extension system is a bridge and link between the agricultural research and production application, which has played an important role in guiding the adjustment of agricultural structure, promoting the progress of agricultural science and technology, increasing farmers' income. In recent years, Guiyang City actively promotes the reform of grass-roots agricultural technology extension system. In 2008, Xiuwen County and Huaxi District started the pilot project. Up to 2010, the city's township agricultural technology extension institutions that the county agricultural department is in charge of, account for 75% of total township extension institutions; the city's township agricultural technology extension institutions that the township government is in charge of, account for 25% of total township extension institutions. There is a total of 79 grass-roots stations, greatly enhancing the level of agricultural science and technology services in Guiyang City. At present, the building of agricultural technology extension system in Guiyang City has entered a critical period of deepening reform. How to seize the opportunity to forge ahead, and further improve the reform and building of agricultural technology extension system, is of great significance to accelerating the development of agriculture, promoting the transformation of agricultural development pattern, and enhancing farmers' income and quality. Based on the survey of 154 farmers in Guiyang City, we analyze the basic situation of building of grass-roots agricultural technology extension system in Guiyang City, and put forward corresponding recommendations.

1 The survey of grass-roots agricultural technology extension in Guiyang City

1.1 Survey explanation We use the method of questionnaire survey and interview for research. The sample farmers are from Nanming District, Yunyan District, Wudang District, Baiyun District, Huaxi District, Xiaohe District, Jinyang District and other districts in Guiyang City; Qingzhen City, Kaiyang County, Xifeng County and Xiuwen County. A total of 189 questionnaires are distributed, and 166 valid questionnaires are called back.

Among the respondents, the men account for 85.82% and women account for 24.18%. The respondents are aged between 25 and 60 years, and the respondents with educational level of junior high school and higher education account for up to 58% (the respondents with educational level of junior college and above account for 15.17%). The families of 59 respondents, located in Nanming District, Yunyan District, Wudang District, Huaxi District, Xiaohe District, and Jinyang District, account for 35.54%; there are 107 households surveyed in three counties and one city, accounting for 64.46%.

1.2 Survey results and analysis

1.2.1 Farmers' current technology sources and channels. The respondents' current technology sources and channels are shown in Table 1. From Table 1, we know that the farmers' existing sources of technology are agricultural technology extension stations (25.90%); the information network in rural areas, rural distance education or short message of cell phone (18.07%); farming experts or large breeding households (14.46%).

This indicates that the rural grass-roots technology extension stations are still an important channel for farmers to adopt new technologies at present, and the preferred organizations from which

the farmers want to get technical services; informatization in rural areas is regarded as a new trend of agricultural technology extension, with prominently important role, and especially for the regions with better popularization level of informatization, such as Yunyan, Jinyang, Xiaohe and Kaiyang, informatization has begun to go beyond traditional training to become an important carrier for the farmers in these regions to obtain agricultural scientific and technical information; the demonstration of farming experts or

Table 1 The respondents' current technology sources and channels

Options	Number of options	Proportion // %
Township agricultural technology extension service center	43	25.90
Information network in rural areas, rural distance education or short message of cell phone	30	18.07
Others	28	16.87
Farming experts or large breeding households	24	14.46
Science and technology training for farmers	18	10.84
Friends and relatives	12	7.23
Professional skill associations in rural areas	8	4.82
Special science and technology correspondent or agricultural science and technology park	3	1.81

1.2.2 The frequency of farmers receiving agricultural technology services annually. Frequency distribution of farmers surveyed receiving agricultural technology services annually is shown in Fig. 1. Fig. 1 shows that the farmers surveyed having not received any technical guidance account for 14.46%, and the majority of farmers can get few technology guidance services of agricultural technology extension. The farmers who have received 1 or 2 times of technical guidance account for 45.78%; the farmers who have received 3 or 4 times of technical guidance account for 25.90%; the farmers have received 5 or 6 times of technical guidance account for 11.45%; the farmers, who have the opportunity to receive more than 7 times of technical guidance, account for 2.41%. Farmers receiving services with low frequency directly leads to decline in the conversion rate and home access rate of advanced agricultural technologies, abates farmers' enthusiasm for adopting new agricultural varieties and new technologies, and weakens the role of agricultural science and technology in leading modern agriculture and new rural construction.

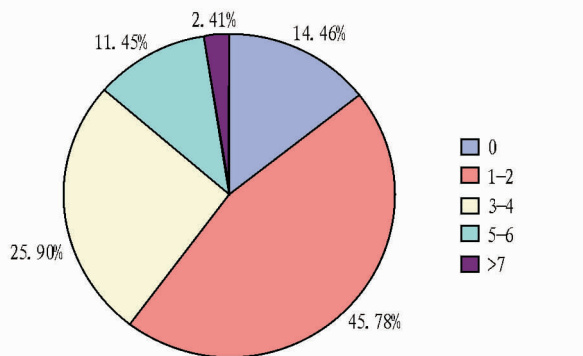


Fig. 1 Frequency distribution of farmers surveyed receiving agricultural technology services annually

1.2.3 Grass-roots agricultural technology departments' agricultural technology extension mode. The survey results show that the distribution of main agricultural technology extension modes of agricultural technology departments that the farmers can get access to is shown in Fig. 2. In Fig. 2, the top three modes are training (37.02%), on-site demonstration (22.16%), and material distribution (15.85%). The agricultural technology extension modes that the farmers like are shown in Fig. 3. The top three modes that the farmers like are the agricultural technology personnel's guidance for households in the countryside (53.95%), learning through radio, television, Internet (14.42%), and farming experts' teaching (10.70%).

large breeding households plays a role in promoting technology, and more than 30% of the surveyed farmers in Xifeng County and Xiuwen County choose this item (clearly, the demonstration households' extension and promotion of new technologies in these two counties is effective); the role of professional technical associations in rural areas of Guiyang City in farmers' channels to obtain new technologies is not obvious.

By comparing Fig. 2 and Fig. 3, we find that there is a great difference between the main agricultural technology extension modes of agricultural technology departments that the farmers can get access to, and the agricultural technology extension modes that the farmers like. The farmers' favorite mode is the agricultural technology personnel's guidance and demonstration for households in the countryside, while the extension departments mainly focus on the modes of training and material distribution in agricultural technology extension. Apparently, the grass-roots agricultural technology extension method is not appropriate, ignoring the basic characteristics of agriculture, and deviating from farmers' ability to receive.

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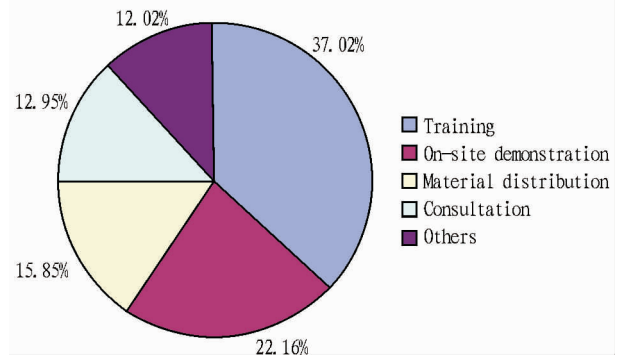


Fig. 2 The main agricultural technology extension modes of agricultural technology departments that the farmers can get access to

1.2.4 Farmers' needs for agricultural technology. The sequen-

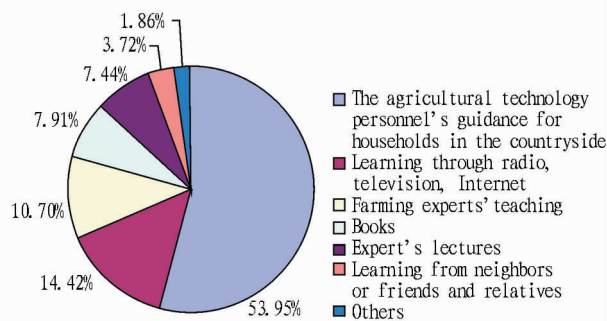


Fig. 3 The agricultural technology extension modes that the farmers like

cing of farmers' demand for agricultural technology is seen in Fig. 4. Fig. 4 shows that the agricultural technology needed by farmers shows diversification, and the top four are farming techniques, disease prevention, improved variety, and processing of agricultural products. It indicates that the farmers are eager for new technology, and their needs for science and technology are increasing, extending from pre-production to post-production. In the field surveys and interviews, the farmers generally believe that the technical services that they have obtained are mainly concentrated in the growing, and other needs are difficult to be met; the technical guidance is mainly concentrated in pre-production and there are few services in post-production.

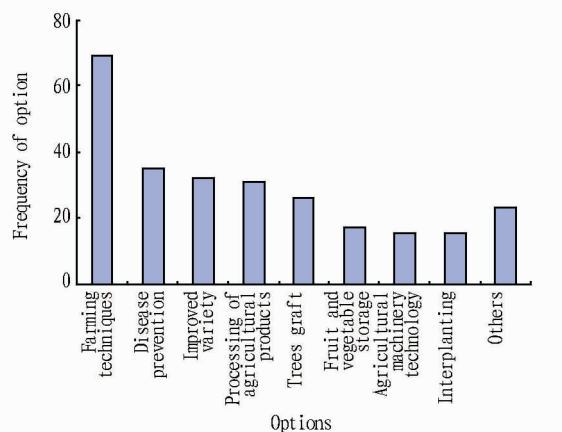


Fig. 4 Farmers' needs for agricultural technology

2 The main problems in the building of grass-roots agricultural technology extension system

2.1 The function of grass-roots agricultural technology extension center weakens

It is found from the survey that Guiyang City has a huge grass-roots agricultural technology extension system, but the agricultural technology extension forces are relatively weak. Although the top one existing technology source of farmers is agricultural technology extension center, it only accounts for 25.90%. This shows that the grass-roots agricultural technology extension center, as the national public welfare extension system, is still the organization that farmers trust, but its function is weak and the role of the main channel is not significant enough, difficult to meet farmers' requirements of increasing income and getting rich. The reason is as follows:

(1) The infrastructure conditions of grass-roots agricultural technology extension center are poor. The experiment demonstration bases are not enough, with poor training conditions and insufficient equipments, making it ineffectively give play to its role.

(2) The business capacity of extension workers is low. A lot of extension workers have not participated in new agricultural technology training for a long time, with insufficient knowledge, and they lack full understanding of new situation of agriculture, new technologies and new means; some agricultural technology extension personnel in the township extension centers are not professional talents. All these make the agricultural technology extension personnel's ability difficult to adapt to the work needs.

(3) The work task of grass-roots agricultural technology extension is not clear.

(4) The phenomenon "hold down a job without doing a stroke of work" in agricultural technology extension personnel restricts the implementation of the agricultural technology extension work. In the grass-roots agricultural technology extension stations administered mainly by township government, human rights, property rights and real rights are managed by the township government, and the county-level agricultural departments are responsible for operational guidance. The work in the towns is often onerous, lacking the workers, thus the agricultural technicians are often deployed to engage in the work arranged by the township government, making the agricultural technology cadres have no time and energy to carry out agricultural technology extension, affecting the play of agricultural technology extension functions.

2.2 The content of agricultural technology extension is difficult to adapt to farmers' needs for various technologies

From the survey of farmers' needs for agricultural technology, we know that farmers' needs for new agricultural technologies, new varieties, and new agricultural machinery show diversification. However, in the field surveys and interviews, farmers generally believe that the technical services they have obtained are mainly concentrated in growing, and other needs are difficult to be met, that is, the technical services are out of step with specific technical demand. It indicates that the structure of grass-roots agricultural technology extension personnel in Guiyang City is irrational, and there is contradiction between the quality of agricultural technology extension personnel and the actual needs of farmers.

Firstly, at present, the agricultural technology extension personnel in Guiyang City are mainly distributed in the traditional crop farming; the proportion human resources in crop farming is too high, while the proportion human resources in breeding industry and rural processing industry is too low, lacking professionals^[1]. Therefore, farmers' needs can not be met in the extension, making the majority of rural areas in Guiyang City are still based on traditional farming, and agricultural structure too simple. In face of diversified and personalized needs of farmers under new situation, there is an urgent need to change imbalanced distribution of the grass-roots agricultural technology extension professionals, to develop and optimize the city's agricultural economic structure.

Secondly, it lacks feedback mechanism for the information on farmers' needs for technology, and the technology promoted is difficult to meet the diverse technology needs of the farmers.

Thirdly, the content of extension work is mainly concentrated in production services, but the pre-production and post-production services are difficult to carry out. Modern agriculture requires the agricultural technology personnel to guide the farmers' production from all kinds of aspects, including visiting farmers, diagnosing the problems in the production and management, helping farmers to seek solutions, and providing farmers with the latest agricultural technology and information to solve the agriculture-related science and technology problems. But the overall quality and experience of the grass-roots agricultural technology extension personnel in Guiyang City at present determine that farmers' needs are difficult to meet and all-around agricultural extension advisory services are more difficult to achieve.

2.3 The extension mode of agricultural technology departments does not adapt to the needs of modern agriculture The key to improvement in the agricultural technology extension efficiency is that the agricultural technology extension methods must be in line with the needs of farmers, rural areas and production. Currently the grass-roots agricultural technology extension mode in Guiyang City lacks farmers-oriented extension idea, and never fully takes into account farmers' lifestyle and behavior preferences, deviating from farmers' ability to accept, and abating farmers' enthusiasm for receiving new technology.

The quality of farmers is an essential characteristic of agriculture in Guiyang City. The educational level of most farmers in Guiyang City is low (illiteracy accounts for 10.06%; primary school accounts for 51.48%; junior high school accounts for 36.23%; senior high school accounts for 1.99%; junior college and above account for 0.24%). For them, short-term training, materials distribution and other modes are clearly difficult to grasp new technology^[2].

It can be found from this survey that all farmers like the learning mode of technical personnel's face-to-face extension. The agricultural technology extension departments should respect the needs of farmers, to choose the extension mode according to the preferences of farmers. Only by doing this can the farmers be helped to increase income and get rich through science and technology.

3 Countermeasures and recommendations for perfecting the building of grass-roots agricultural technology extension system

3.1 Strengthening the input of funds and ensuring that the basic work of public welfare agricultural technology extension is smoothly carried out The agricultural technology extension, as the national public welfare extension system, is of necessity and importance under market economy. Its public welfare function must be guaranteed by the strong financial support. It is necessary to strengthen the input of funds, improve working conditions and infrastructure, to ensure that the grass-roots agricultural technology extension center's work is smoothly carried out; provide the funds for the township agricultural technology extension institutions to fulfill public welfare functions, improve the standards of funds

in the township agricultural technology center, to ensure that the daily township agricultural technology extension work is normally carried out; strive to include the township station's business funds for extension in the fixed budget and long-term input of local finance.

3.2 Innovating upon the system and improving the function of grass-roots agricultural technology extension center Innovating upon the operation mechanism of agricultural technology extension is the key to ensuring the vitality of grass-roots agricultural technology extension system. Firstly, the experimental units exercise the vertical leadership over poverty-stricken areas. The mode of direct leadership by the Municipal Bureau of Agriculture is recommended for the poor, and backward areas. In these areas, the government is in face of financial difficulties, hard to take into account the agricultural technology extension input. It can be regarded as the dispatched institution by the Municipal Bureau of Agriculture, to implement vertical management, in order to ensure that the work is smoothly carried out. Secondly, it is necessary to establish cross-regional agricultural technology extension stations. Currently, the grass-roots extension institutions in Guiyang City are attached to the setting of the administrative system, which are mainly distributed at the county and township levels. We should overcome the geographical constraint to establish stations. In accordance with the requirements of natural conditions, agricultural regional characteristics, agriculture-led industry and specialty industry in Guiyang City, it is necessary to take actions that suit local circumstances to set up cross-township regional agricultural technology extension centers, ensuring the efficient operation of agricultural technology extension.

3.3 Implementing management on agricultural technology extension personnel's performance and promoting the extension efficiency First, there is a need to establish grass-roots extension worker responsibility system and quantify the extension staff's work. In each town, the agricultural technology staff should be responsible for at least one village, providing services for about 20 demonstration households. Specifically, they are responsible for organizing the village to carry out the demonstration and extension of new varieties and new technologies; helping to implement the major agricultural science and technology projects, new public welfare technologies, demonstration technologies and experiment technologies; timely reporting the farmers' technology needs to the Municipal Bureau of Agriculture; publicizing the contact telephone number of agricultural technology extension personnel in each village, so that farmers can supervise the agricultural technology extension staff's services.

Second, it is necessary to implement strict quantitative assessment. For the individuals who have made outstanding achievements, we should give them municipal agricultural technology extension award. Through the implementation of personal responsibility, evaluation, assessment, and incentive systems, we should promote the extension staff's service level, and stimulate their enthusiasm, so that they can conscientiously provide techni-

cal guidance and information consultation for farmers.

3.4 Strengthening the building of extension team in rural areas and cultivating high-quality agricultural technology extension personnel

The grass-roots agricultural extension personnel are the important people for implementing and promoting the agricultural technology extension work, whose quality is directly related to the extension efficiency. In order to disseminate new knowledge and technology to farmers, the extension workers should not only have excellent professional skills, but also have good overall quality.

(1) Setting up special funds for the grass-roots agricultural technology and personnel's training, to strengthen the training and further education for the grass-roots agricultural technology staff. It is necessary to regularly organize the agricultural technology extension personnel to participate in the knowledge of professional knowledge, dissemination knowledge, and modern information processing knowledge; strengthen further education for them, and adopt the ways of advanced study and exchange to effectively improve the operational capacity of agricultural extension workers; at the same time, strengthen the training of professional ethics and improve the overall quality.

(2) According to the specific circumstances, introducing, recruiting and employing professional agricultural technology backbone, genuinely talented professional technical personnel, and university graduates to engage in the agricultural technology extension work, in order to expand the agricultural technology extension team, and improve the personnel structure of agricultural technology extension team.

(3) Gradually implementing the qualification access system of agricultural technology extension personnel. It is necessary to issue vocational qualification certificate to the qualified agricultural extension personnel through the examination and assessment, and take it as the basic condition for the employment of agricultural technology extension personnel.

3.5 Exploring the advanced service mode to meet farmers' needs The grass-roots agricultural technology extension center should explore the advanced service modes, and take the initiative to provide services for market economy, to satisfy the farmers.

(1) Vigorously carrying out the network informatization extension services. There is a need to strengthen rural informatization construction, and open hotline for agricultural technology extension consultation in some agriculture-related web sites in Guiyang City, with public welfare service as the purpose, to answer

farmers' questions in the network, so that farmers can get instruction and guidance from experts at any time. For the universal and typical questions, the distance education network and information caravan can be used for demonstration and popularization.

(2) Establishing the demonstration bases and demonstration households, and using the technology diffusion effect of the demonstration bases and demonstration households to improve the technology extension coverage. There is a large agricultural population in Guiyang City, with significant differences; it is difficult for agricultural technology extension personnel to directly provide services for each farmer, so it is necessary to strengthen the construction of demonstration bases and demonstration households, to promote the popularization rate of new technology. The practice of Xifeng County and Xiuwen County proves that demonstration has played a significant role in promoting and popularizing technology for farmers, and we should seriously sum up experience. At the same time, it is necessary to broaden the content of the demonstration, developing from the promotion and demonstration of planting and breeding technology to the diversified direction of epidemics prevention, processing and storage of agricultural products, and agricultural machinery technology, to meet market demand, and improve the farmers' satisfaction.

(3) In addition, to meet farmers' needs, we should establish and improve the public welfare grass-roots extension system; adopt policy support measures to actively support and guide agricultural research institutes, educational institutions, agribusiness, and farmers' specialized cooperative organizations, to participate in agricultural technology extension service; gradually build a diversified grass-roots agricultural technology extension system with public welfare nature as the main body.

References

- [1] Bureau of Agriculture of Guiyang City. Guiyang 12th five-year plan agriculture science-technology development strategy research report 2011–2015[EB/OL]. (2011–01–20) <http://www.doc88.com/p-70483597681.html>.
- [2] Bureau of Agriculture of Guiyang City. The second agricultural census main data bulletin of Guiyang City[EB/OL]. (2008–05–16) <http://www.gygov.gov.cn/gystjj/2451930721149779968/20081128/146532.html>.
- [3] HE Z. Comparison of the three cooperative types of agricultural technology popularization based on the industrialization of tomato industry in Xinjiang autonomous region [J]. *Asian Agricultural Research*, 2011, 3(1): 11–13, 67.
- [4] JU F. Study on the problems in agricultural technology extension system of Anhui towns and villages and its countermeasures[J]. *Journal of Anhui Agricultural Sciences*, 2011, 39(6): 3717–3718. (in Chinese).
- [5] Public goods supply in the perspective of organizational competition[J]. *Asian Agricultural Research*, 2011, 3(4): 70–71, 82.
- [6] SUN GQ, LIU HJ, SUN YH. The problems and countermeasures of the supply system of public goods in rural areas[J]. *Journal of Anhui Agricultural Sciences*, 2011, 39(5): 3129–3130, 3134. (in Chinese).
- [7] YI FW. The public policy system of the supply of new countryside public products. [J]. *Journal of Hubei University of Economics* 2006(4): 84–87. (in Chinese).

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- [4] SCHULTZ TW. Investment of human capital[M]. Beijing: Beijing Economics Press, 1990: 7. (in Chinese).
- [5] PANG ST. The origin of “three rural”[J]. *Jianghai Journal*, 2008(4): 23–25. (in Chinese).
- [6] ZHOU WW. Ethic, sense, freedom[M]. Shanghai: Xuelin Publishing House, 2006: 174. (in Chinese).
- [7] QI XX. The theoretical foundation and its mode transformation of rural pub-