Study and Practice on Farmer-Participate-to-Experience-Type Agricultural Extension Method

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Abstract. Effect of agricultural technology extension depends largely on the farmers' participation and acceptance. This paper constructed farmer-participate-to-experience-type agricultural extension method from the participation subjects, objects selection, participation mode, achievements selection, team organization, management mechanism, etc.. It had carried on the case analysis, and put forward some suggestions for the further development of the method of application. The results showed that, farmers participation rate was 100%, farmers application rate reached 82% of new technology promotion, per capita income 27.6% increasing, effectively promoted the transformation of agricultural production and farmers' income increasing.

Introduction

In the new period of our country agriculture transforming from traditional agriculture to modern agriculture, agricultural technology extension work is facing a great challenge. Farmers' participation is an important factor that influences the agricultural technology promotion effect. Facing new technologies or new varieties, many farmers are not immediately getting to use based on risk considerations. They believe their own practical experience more. Agricultural extension methods are varied, but no matter what kind of methods, its generalization performance size is closely related to the degree of participation of extension objects (farmers) [1]. The higher degree of farmers'participation is, the bigger it influences, and the higher farmers' interesting can be aroused. The probability of farmers adopting new technology and new varieties or new methods will be higher. The chance of success is greater.

"Participate-in-type" came from the twentieth Century 80 years in the international production Participatory Rural Appraisal (PRA), was widely used in Rapid Rural Appraisal (RRA) [2, 3], it could utmost mobilize the enthusiasm of the project participants, and promote to complete projects. Conceptually, participatory extension refers to the promotion of objects to be able to participate in promotion activities, the dissemination of knowledge and research discussion, and other individuals to learn together, to improve the way of promotion [5]. The domestic research on participatory philosophy focused on participatory training of farmers, the Participatory Agricultural Extension just makes a preliminary theoretical analysis [5-7], such as Di ZHAO, De-Hai WANG believes that participation is a kind of humanistic concept of modern agricultural extension [5]; Li JING analysis of Farmer Participatory Agricultural extension to be aware of the problem [6], etc., there is little research and practice on application of the theory. This research constructs related methods from the perspective of practice, and takes case analysis on application, in order to provide a reference for the development of agricultural technology extension methods.

Method Constructing

It is the core of participate-to-experience-type agricultural extension method that to maximize attract farmers to participate in. Through participation and experience, the farmers feel the application efficiency and convenience that new technology brings, so as to shorten the extension cycle maximumly, improve transformation efficiency. The method mainly includes the following contents,

Participation Subjects

Agricultural extension is the activity of sci-tech education, or sci-tech diffusion, with farmers as objects, education as the means, and new knowledge, new technology, new skills and new achievements as contents. Therefore, it needs all subjects of agricultural sci-tech extension to participate [4]. In general, agricultural technology extension system is consisting of government, colleges and universities, research institutions, enterprises related to agriculture, rural cooperative organizations and farmers, to function together [9]. In the course of participate-to-experience-type agricultural extension method application, colleges and universities and research institutions are the main leaders of technology, put specific implementation into action. Of course, government is indispensable, which plays a guiding role, to ensure that the project operation of the external environment; agricultural enterprises, farmers cooperative organizations are generally acted as objects, to bear an important responsibility for the implementation of farmers organization.

Objects Selection

Selecting objects scientifically in the method is the key to success in its application. Objects selection should pay attention to the three principles, the first is *Demonstration*, namely objects should have a certain scale of the industry, have a demonstration effect; the second is *Demand*, namely the promoting technology met local needs; the third is *Operational*, namely objects with practical conditions for the implementation of. Therefore, objects selection generally should be a certain scale agricultural enterprises, professional cooperation organizations, Sci-Tech Parks and professional production of the villages with good basic. Mainly based on the following three factors: (a) they are belongs to groups of demands, have ensured scales and demonstration effects; (b) they generally have a more strict organization, can realize the effective management and control, to ensure the effective execution test; (c) they could drive farmers to participate in, only when the broad farmers participate, can it achieve participation experience of applied technology.

Participation Models

According to the difference of participants involve in different projects, this method may include the following models:

(1) Participate-in-type test. Aiming at the objectives promotion, combining the productive practice, the new technologies and existing technologies would be tested in the production process. Through participation, the specific operation, farmers obtain the perceptual cognition specifically, promoting the desire and demands on application of new technologies.

(2) Experience-type technology demonstration. Let the farmers, who have some basic skills and experience desire, demonstrate technologies which need to popularize, under the guidance of experts, and record the production. The farmers experience the process of technology. And take benefit analysis and evaluation when production ended.

(3) Experience-type production competition. In general, it can be put up in agricultural enterprises, farmers professional cooperative organization with well-organized and well-driving or professional producing village with highly organized, requires the implementation of group technology with high uniformity, and the promoting effects would be efficient. In the actual operation, it can also be used in objects which technology applied polarized, to carry on production competition between new technology and traditional technology.

(4) Participate-to-experience-type training. Let the farmers start directly with lots of technical practice, through personal experience, to enhance the technical knowledge and acceptance.

(5) Participatory personnel training. The shortage of talents is one of the important bottlenecks in Agricultural Technology Extension. Therefor, let the young man involve in the promotion process, the old expert mentoring, it not only enables young people to speed up the master technical achievements, but also encourage them to grow up and down to earth. Their growth in practice exercise, will be very favorable to talents continuing of the agricultural technology extension system construction.

Achievements Selection

Achievements used in participate-in-type promotion method should firstly focus on demands, that means they must be closely combined with local industry, namely, based on local certain demands of industry that they have been developed or are developing. So the possibility of farmers to participate would be larger. Secondly, to have the scale, the scale of demand is helpful to improve the demonstration effects. Third, consideration should also be given to the technical difficulty. The best is simple and easy to learn, easy to operate, so that farmers can quickly grasp them. Otherwise it will increase the difficulty of operation organization, and the participants experience effect will be reduced.

Experts Team Organization

Experts are human resource basis of the implementation of agricultural extension services, are also the technology supports to carry on sci-tech achievements demonstration [9]. The selected experts should fit the need situation, and they must have profound theoretical knowledge and rich practical experience in production. Generally, to take selection experts who master the latest scientific and technological achievements and practical ability as the backbone of technology experts group. And then according to demands, to absorb some of the youth to participate, let them grow in science and technology service, expanding the popularization of science and technology experts reserve force, forming expert resources echelon focused.

Management Mechanism

Establish the organizational management mechanism is one of the key factors influencing the success of participate-to-experience-type agricultural extension method. The application of this method should be based on certain sci-tech promotion projects, therefore, must be based on a project management approach to develop a completed and a detailed implementation plan, to ensure the effective enforcement. At the same time, it needs to establish docking mechanism of needs, or effective supervision mechanism of performance appraisal, ensuring that the popularization of science and technology should be carried out, to ensure the promotion effect. Two aspects of performance appraisal should be carried out, the one is evaluation of project participation experts, to ensure that the promotion of technology of landing; on the other hand, it should be established a scientific and rational farmers to participate in evaluation and incentive system, to stimulate their enthusiasm, ensure the effectiveness of technology application.

Case Analysis of Application

The Application Object

Lvfu Vegetables Professional Cooperative of Beijing City Daxing District Zhangziying Town was selected as the application object. It was founded in 2008, mainly to the cultivation of lettuce, spinach and other leafy vegetables, member 150 people, with members of the cooperative specialized institutions, organizational system, high prestige, strong drive ability. Local is the professional village that has more than 10 years of history of lettuce planting, more than 90% farmers are the society memberships, the production base covers an area of 600 acres, a total of greenhouse 90, 170 plastic houses, fresh-keeping storehouse of 300 square meters, 900 square meters of processing base, annual output of more than 2500000 kilograms, radiation to the surrounding 2000 acres.

The Main Technical Requirements

After the preliminary investigation, it was showed that because of more crop rotations in lettuce production, the intensity of labor was big, most of the local production facilities for small span steel shed (10 x 40 ~ 50 m), the internal space was little, not suitable for mechanized operation, so the local general using artificial planting, labor input was larger, combined with the labor older (average 59.2 years), as a result, it was determined to promote the province labor demand strong light-and-simplified cultivation technique system. In view of the demands, at the base, popularizing application of light-and-simplified lettuce cultivation and supporting technical system were carried out. By covering a lettuce production technology in the whole stages of more than 10 items of technology integration, including: lettuce light-and-simplified cultivation technique integration, lettuce varieties introduction and demonstration, soil testing formula fertilization, substrate seedling, and disease prevention throughout the key technologies and demonstration etc..

Determine the Promotion of Technology

(1) Exhibition and demonstration. The introduction of new varieties of lettuce evaluation, demonstration varieties lettuce, invited the farmer participatory production control.

(2) Lettuce Simplified Cultivation Technology Integration. Includes, the promotion of the higher bed semi-mechanization, mechanization planting technology, the reasonable border and the best mode of cultivation; screening to small area of operation to the automatic seeding machine, transplanter, mounding machine.

(3) Contrast test seedling screening technique. Invite farmers with better conditions, to carry out technical test matrix block or substrate seedling, and invite a number of farmers from conventional breeding, experience technology contrast.

(4) The experience-type soil testing and fertilizer application. In different position of the base representative, to select farmers' plots for soil sampling, propose soil testing and fertilizer solution based on the analysis, please farmers cooperate to implement experience technical effect.

(5) Key technologies and demonstration of the prevention and control of disease. To carry on lettuce diseases survey, comprehensive prevention and control technology test which farmers participated in, put forward the lettuce plant protection safety production key technology system, and carry on application promotion.

(6) To carry out the experiential technology in field training. Combining different lettuce crop cultivation stage, to promote technology in field training, please farmers to personally experience the technical operation, application in practice to learn new knowledge, master new technology.

(7) Widely participation yield contest. Broad participation of farmers organization base technology application of lettuce yield contest, technology application to experience operating procedures, to experience the effects of technology.

(8) Personnel training in sci-tech promotion process. Using participating experience test process, to train young technology promotion experts and village agricultural extension service personnel and the general staff's etc..

Application effect

Experiments were implemented in 2012-2013 years. The following is the effect of lettuce light-and-simplified cultivation integration technology promotion:

Experts and Farmers Participation

The collection of 12 agricultural experts from several professional institute of Beijing Academy of Agriculture and Forestry Sciences, such as soil and plant nutrition expert, vegetable cultivation technology expert, plant protection expert, sci-tech information services expert, realized the expert team integration. In the process test experts had been deep into test base, serving more than 300 person-times, experts into the village or into the field rated at 100%. 26 peasant households on 26 head lettuce cultivars and 19 leaf lettuce cultivars were planted as contrast in two batch; the higher bed semi-mechanized cultivation technology application experience of more than 20 households; 10

households experience light-and-simplified equipment application; participation matrix block and substrate seedling of 6 households and 10 households in conventional breeding to compare; 41 farmers in soil sampling test; 13 households involved in the key technology for the application of lettuce diseases prevention and control; organized farmers to carry out high yield production competition 1 times, in 43 households. It was more than 4000 person-times that farmers participated in technology application and experience, average per capita 20 times during the project. Test farmers participation rate was 100%. It had been organized to participate in experiential practical technical training 50 times, experiential observations 5 times, more than 2100 person-times participated in. 3 young experts were trained, 5 people in the town sci-tech promotion personnel were cultured, docking village general agricultural technician 20 people.

Techniques to promote the effectiveness of

Screened out good comprehensive characters of 3 varieties of head lettuce, leaf lettuce varieties 3, heat resistant varieties 1; introduced and selected of light and simplified equipment automatic seeding machine, transplanter, mounding machines each 1, farmers' production experience favorable rate above 90%; matrix block seedling rate of net was composed of a conventional 75% to 82%, output reached 28323 kg / ha (Over summer cultivation season), 26% increase; soil testing and analysis of 300 items or times; recommended fertilization scheme 41, 38 households of farmers' adoption of application, application rate of 93%; output increasing farmers accounted for 100%; carried on induced resistance seedling, downy mildew and efficient fungicides for the control of plant protection tests 7 items, promoted the lettuce diseases effectively controlled in demonstration area, farm chemical use reduction 30%, plant protection cost of labor to reduce 50%. Production yield contest farmers seasonal increase farmers accounted for 98%, only 1 household due to accidental factors caused the production decrease. According to statistics, the core technology reached 14 in the process of integration test, including demonstrate lettuce varieties, fertilization, salt control management, small-high-ridge cultivation dense planting, substrate seedling, mechanized transplanting, disease and pest integrated prevention and control,etc., the new technology of farmer general application rate reached 82%, agricultural achievements application rated of 100%, some materialized technologies transformed directly such as plant varieties.

Comprehensive benefit

Test integration technology to increase acres price reached 1561 yuan, the yield savings benefits reached 15000 yuan /ha, the average household income increasing by 31.7%, per capita income increased 27.6%. The training of young experts was 3 people, including 1 senior titles to achieve promotion; cultured village science and technology promotion personnel 5 people, 3 people in the business assessment was outstanding; docking village general agricultural technician 20 people, Community service driving effects and agricultural members performance appraisal were among the best in the district, realized win-win Technology promotion, economic benefits and talent cultivation. The experiment was a complete success.

Conclusions and Recommendations

Conclusions

Farmers are an important force in promoting technology popularization.

Without the participation of farmers, technology popularization cannot be completed. Thought decided to act. The farmers' will and participation, are the key to technology promotion activities. Only the farmers themselves to know the importance of technology to improve production, can it constantly promote the development of technology progress.

Demands are the important power to promote the technology promotion.

Our past technology promotion activities, generally is the government leading, focus on pushing, audiences passive, and farmers' vital interests are not relevant, effectiveness cannot be guaranteed. The technical promotion based on the accuracy requirements, with the technology of passive "push", becomes to active "suction", dynamic mechanism is obviously different, thus it gets the multiplier effect.

Technical promotion effect is proportional to the farmers' participation.

Farmers' knowledge and technical background difference is big, therefore, they need more "role model" from the side. Participate-to-experience-type methods, make full use of the farmers' participation, put technology popularization into the course of farmers production, let farmers to participate and to experience, shortens the technology transmission path, thus it can get more.

Recommendations

We should explore diversified, social participation mechanism of agricultural technology extension system.

Transform government functions, explore establishing new agricultural technology mode to farmers as the center; draw on the experience of developed countries, set up promotion of specialized agencies in colleges and research institutes, to promote transformation ability and promote efficiency of ; exploring social participation agro-technique extension mechanisms[8], encouraging agricultural enterprises, professional cooperation organizations and sci-tech demonstration households positive plunge into the agricultural technology promotion, play a better role driven and service; fully respect the farmer, arouse the enthusiasm of farmers to participate in science and technology promotion. Through the government, colleges and universities, scientific research units, agricultural enterprises, cooperative organization and farmers participating, to propulsion to promote efficiency of agricultural science and technology achievements transformation.

Straighten out of agro-technique extension relationship between subjects and objects.

Turn the relationship between subjects and objects, from "push and receive", into mutual cooperation partnership [7]. Respect farmers' will, encouraging farmers as a leading role in the whole process. The government in the process should be more play to the role of the planning, guidance and services, rather than command and administrative intervention. Agro-technique extension subject together with farmers, equally participate in the understanding of reality, the analysis of the problem and to identify development goals, the development process of operation, maximum limit stimulates their sense of responsibility, to take part in the application and extension with the attitude of ownership.

Respect farmers' will, attach importance to farmers' demands.

Since the main body of technology adoption is farmer, so the choice of technology and application should respect the wishes of farmers, should not be forced to promote technology against the wishes of farmers. Based on respecting the will, exploring the demand, aiming at the real problems farmers facing, to make good use of their potential, to a proper extent to promote farmers technological needs, it would be twice the result with half the effort. In the technical promotion process, pay more attention to communication with farmers, through the analysis of mining demand, improve the power of technical application.

Need to improve farmers own quality constantly.

In order to make farmers participate fully in agricultural extension, must speed up the upgrading of their scientific quality, enhance the ability of science and technology. In the process of agricultural technology extension, in addition to teaching technology, we should pay more attention to farmers education and training systematically and purposefully. To promote farmers to broaden their horizons, enhance the enthusiasm of active learning, train analysis, judgment ability and consciousness, willing to accept new technology, new knowledge, enhances the comprehensive quality. In the long run, must do a good job in the basic compulsory education in rural area, generally improve the scientific and cultural level of future farmers. At the same time, developing and perfecting occupational education system to promote the peasant farmers to be occupational, can cause long-term sustainable agricultural technology extension.

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