

Promoting Development of Water-saving Agriculture

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Since the start of the 11th Five-year Plan, China's Ministry of Agriculture has followed the instructions on development of water-saving agriculture from the central leadership. The ministry has promoted the development of water-saving agriculture by issuing documents, convening sessions, and launching pilot projects and other activities. Agricultural departments at all levels actively responded to the call, strengthened organization and their leading roles, continuously increased the input and set up demonstration areas for water-efficient agriculture. Also, efforts have been made to educate the public and encourage social engagement, and to lead farmers in water-efficient agriculture campaigns. Through these efforts, achievements are made and experience is gained, and remarkable economic, social and ecological benefits are received.

First, step up government efforts. To speed up the development of water-saving agriculture, the Ministry of Agriculture issued *Opinions on Promoting the Development of Water-saving Agriculture*, formulated a series of documents including the *National Plan on Water-saving Agriculture and Standards on Establishment of Demonstration Areas for Farmland Water-saving*, *Instructions on Plastic Mulching*, *Instructions on Integration of Water and Fertilizer*, and the *National Work Plan for Monitoring of Soil Moisture*. The ministry has convened annual meetings on water-saving farmland irrigation for six consecutive years and launched several technology demonstration programs to push its development. Party committees and governments at all levels attach great importance to this and have incorporated it into strategies of sustainable development of agriculture. Leadership and inputs have been stepped up to fully accelerate the process.

Second, speed up integration and promotion of technologies. Agricultural departments at all levels are focused on integration and extension of a batch of main technologies, particularly plastic mulching and drip irrigation under mulch and integration of water and fertilizers. Local authorities focus on key crops and competitive industries and take into account factors like local natural conditions, economic development and water resources. They are working to combat drought in a proactive and scientific way. Nine efficient water-saving agricultural models have been developed, all of which are highly targeted, practical, easy to operate and cost-effective. A bunch of demonstration areas for water-saving irrigation are set up in a variety of regions under different water resources conditions. A breakthrough was made in northeast China by applying plastic mulching and drip irrigation under mulch and integration of water and fertilizers for the first time. Afterwards, large-scale promotion of the technologies was rolled out in the "Three Norths", opening up a new path that emphasizes water-saving agriculture in arid and semi-arid areas. In recent years, an annually extended land area using these main technologies has reached an average of 26,667 million hectares.

Third, concentrate on building of demonstration areas. To accelerate the promotion and

application of water-saving technologies in farmland irrigation, provinces (autonomous regions, municipalities directly under the central government) have given play to advantages of local agriculture, given prominence to key areas, main crops and key technologies and set up more than 100 demonstration areas that feature different crops, technology models and management methods. Through the combination of main crops and key technologies, integration of engineering measures and agronomic practices, association of demonstration with promotion, connection, of outcome display and farmers' training, a new landscape of regional water-efficient has basically taken shape. The "Three Norths" dry farming area is dominated by corn and potatoes, using the main technology of full plastic mulching and twin-row rainwater harvesting; in the main winter wheat producing area of the North China Plain, the method of measuring soil moisture to improve irrigation is applied; the southwestern seasonal dry farmland is dominated by corn and potatoes with the main technology of half plastic mulching and rainwater harvesting for irrigation; in better irrigation areas, cash crops are grown using the technology of drip irrigation under mulch and integration of water and fertilizer.

Fourth, ensure a good harvest and improve farmers' income. The development of water-saving agriculture in recent years has unlocked huge potential production growth, increased grain production by a big margin, upgraded the growing structure, facilitated development of related industries and raised farmers' incomes. After full plastic mulching is applied to corn, yield is increased by more than 2.25 tons. Thanks to integration of water and fertilizers, more than 1,500 cubic meters of water is saved and rural income is increased by more than 7,500 yuan per hectare. Minhe County of Qingdao Province, which was originally not suitable for growing corn because of low rainfall, has successfully introduced full plastic mulching to bring the corn yield to three times the wheat. The technology, quickly extended to the whole county, has changed the planting structure. High-yield corn production is then fully promoted, increasing its total crops yield from 115 million kilograms in 2008 to 185 million kilograms in 2010. Expanding the corn producing area enabled the average income of Minhe farmers to increase 533 yuan in 2010. In 2011, another 20,000 hectares are developed, and accordingly, per capita income was raised by 800 yuan. In Gansu Province, the annually extended area to which full plastic mulching is applied stands at more than 667,000 hectares, equivalent to 25% of the province's entire sown area. That is to say, more than half of the crops production of the province comes from only one fourth of the total sown area.

Fifth, let water-saving agriculture play a big supporting role. Experts estimate if efficient agricultural technologies are fully implemented, wheat and rice production have the potential of saving 36 billion cubic meters of water, the equivalent of an incremental irrigation area of 5.467 million hectares. If calculated at an extra yield of 150 kilograms of grain per mu, grain productivity will increase by 12.3 billion kilograms. In addition, raising utilization of natural precipitation in dry farmland can save 26 billion cubic meters of water. Meanwhile, through the adoption of water-saving technologies, if grain productivity in irrigated areas is increased by 0.1 kilogram per cubic meter and grain productivity per millimeter of rainfall is increased by 1.5 kilogram per hectares, then food productivity will increase more than 50 billion kilograms.

Sixth, continuously expand investments. According to incomplete statistics, each year a total of more than 10 billion yuan is used for water-efficient agriculture. For example, 38 billion yuan was invested in a water-saving campaign which was launched in China's three northeast provinces and the Inner Mongolia autonomous region during the 12th five-year

period. A total area of 2.533 million hectares has been set up for application of highly efficient water-saving technology. Jilin invested 8 billion yuan and Liaoning 6 billion. Investment has also been enlarged in provinces and autonomous regions including Gansu, Xinjiang, Inner Mongolia, Shanxi, Shaanxi, Hebei, Guangdong and Guangxi.

The overall objectives for water-saving agriculture include the following: increasing grain yield, addressing water shortage in agriculture, addressing the threat posed by drought to production, strengthening drought-resistance and disaster relief, raising crop water productivity, and increasing comprehensive productivity of arable land. To achieve these goals and ensure sustainable development of agriculture, the Ministry Of Agriculture will work hard to further extend a water-saving area of 6.667 million hectares and rise agricultural productivity using irrigation water and natural precipitation both by 10% by the end of the 12th five-year period.

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