

Potentials for Organic Agriculture in Xinjiang, China

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ABSTRACT

In general, it is difficult to control weeds, diseases and insects with no chemical material in large scaled cultivation. Particularly, it is nearly impossible for a temperate country with a lot of rain such as Japan or Korea, to make organic agriculture on a large scale. Are there any possibilities to develop a large scaled organic agriculture in the world? In Xinjiang where is located in the central Asia, there is a great possibility for developing organic agriculture on a large scale. We established Shihezi Agricultural and Environmental Institute for Arid Area of Central Asia three years ago in Shihezi, Xinjiang, China, for improving crop production in arid area. One of the main objectives is to establish organic agriculture in Xinjiang, with using suitable conditions for agriculture.

1. Environmental and social conditions in Xinjiang

Xinjiang is located in the central Asia, the most western province of China, situated lat. 34.4~49.2 N. and long. 73.4~96.4 E. The area of this province is 1.66 billion km², which is one 6th of China. There are 3 high mountains extending east and west with 2 basins including Taklamakan and Dzungar deserts.

The total precipitation is about 100~400 mm per year. Especially, there is a very few rain around the deserts. The amount of evaporation is more than 1500~2300mm and 2000~3400mm per year in the northern and southern parts of Xinjiang, respectively. The hours of sunlight is 3000~3200 per year, showing abundant solar energy. The maximum daily and yearly temperature range is 11~15°C and 60°C, respectively.

Although the amount of precipitation is very low, there is abundant supply of water for irrigation due to much snow-water from mountains in considerable part of the agricultural area.

The agriculture in Xinjiang depends largely on irrigation. The infrastructure of irrigation has been developed from ancient period. In particular, the large scaled irrigation systems have been constructed from 1950s. The drip irrigation system has been adopted recently, with a plan to expand this system to 200,000 ha by 2005.

Xinjiang province is one of the largest agricultural industries in China. Especially, the cotton production in Xinjiang is almost a half of the national production (China is the leading country in the world for cotton production). In addition, the yield levels of wheat and maize are also higher. Recently, however, a problem for repeated cultivation of cotton is becoming serious. Since the cultivated area of cotton has exceeded more than one 3rd of the total cultivated acreage, it is difficult to adopt the rotation with other crops.

In Xinjiang province, there is an organization of the agricultural soldiers up to now. This organization, the army corps for production and construction, is consisted of a few million people and has hundreds of large farms, industrial corporations, and own police and court systems. This organization has systematic and advanced technologies in agriculture as compared to ordinary farmers. If we use the farms of this organization., it is easy to introduce new technologies and large scaled cultivation due to a well-organized structure.

II . Organic agriculture in practice

We are trying organic cultivation of cotton and soybean at the institute from 3 years ago. The main diseases and insects for cotton are wilts and damping-off, and aphids, mites and cutworms, respectively. Other diseases and insects are not serious due to arid in summer and severely cold in winter. We could control wilt and damping-off diseases, and cutworms to some degree by using the organic fertilizer composted by special microbes and the soil conditioner made from fly ash. Aphids and mites could be also restrained by splaying the extracts of the plants including insecticidal effects.

Although aphids and mites broke out largely in Xinjiang this year, we could control its by only usage of the bio-insecticides. In soybean, the main insects are also aphids

and mites.

However, these are not so serious as cotton, so we did not need to use any chemical nor bio-insecticide during these three years. If we need to control its perfectly, we can grow soybean at the aphid and mite free area with rather high elevation.

Weeding is also not serious due to arid conditions. In addition, the drip irrigation system has decreased weeds as compared to the traditional flood irrigation system. Since the spread of weed seeds can be limited by the drip irrigation.

Xinjiang has a lot of good conditions for developing organic agriculture on a large scale, i.e., cheap and abundant labor, well-organized farms, and plentiful solar energy as well as a few diseases, insects and weeds. There are also vast areas where irrigation systems have been made. Xinjiang is showing considerable promise as a base for not only food production but also agricultural products with added values as organic cultivation.