

10th International Conference on

AGRICULTURE & HORTICULTURE

October 02-04, 2017 London, UK



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Organic agriculture obtains both larger yield and economic benefit under the condition of none chemical pollution

Due to the input of many chemical substances and the termination of elements cycling, the farmland ecosystem has been seriously degraded, with the quality of farmland and yield being decreased. High efficiency eco-agriculture has been believed to curtail some hazardous effects associated with chemical agriculture. However, debates also exist on whether organic agriculture can feed a world with increasing human population. We hypothesized that some improvements on high efficiency organic agriculture may produce adequate foods and reduce environmental pollutions from chemical agriculture. This study began with feeding cattle by bio-processed corn straw, restoring the soil fertility by manure returning in Hongyi Organic Farm. We applied physical + biological methods for pest control; artificial + mechanical for weed management, thus to put an end to pesticides, fertilizers and herbicides pollution. Meanwhile, without using plastic films, synthetic hormones, genetically modified seeds, we guaranteed the food quality and safety, and sold the products online and offline. The results of the 10 years experiment are as follows: The weight of pests captured by insect-trapping lamp reduced from 33 kg to 2.1 kg, reducing the amount of pesticide by 93.8%. The annual consumption of straw by cattle reached to 1000 t per year, increasing straw utilization rate from 1.1% to 62.5%. Organic fertilizer has been tested to improve soil biodiversity, for instance, the number of earthworms in organic orchard was 317 individual m⁻², while only 16 individual m⁻² in ordinary orchard. The soil organic matters in 0-20 cm depth layer increased from 0.7% to 2.4%, thanks to great amount of cattle manure being applied (75 t hm⁻²). The grain production also increased greatly from the initial 11.43 t hm⁻² to 17.43 t hm⁻². The wheat, corn, soybean and peanut yield were 42.6%, 60.9%, 32.2% and 38.1% higher than ordinary farmland around. Due to the excellent quality of products, our products have been sold to 30 provinces except Tibet of China, with the average benefit per acre being 3-5 times of ordinary farmland. Some 67 local households have been engaged in the high efficient eco-farming industry. Now the products extended to the ginger, garlic, onion and other vegetables; pork, beef and poultry eggs, apple and other fruits, peanut oil, soybean oil and processing products, walnut cake, dried apples, dumplings, etc. The regular consumers of Hongyi Organic Farm have increased to 1672 people and increased at a speed of 100-150 people a month. This high efficiency eco-agriculture in paper has been used by entrepreneurs, farmers, soldiers in Shandong, Henan, Hebei, Inner Mongolia, Gansu, Zhejiang, Jiangsu, Guangdong and other provinces, the farmland area was about 9667 ha. This study provides a scientific basis for the national organic or eco-agricultural development designing, poverty alleviation and rural environmental protection.

Biography

Jiang Gaoming, PhD □ PI of Institute of Botany, Chinese Academy of Sciences □ Professor of University of Chinese Academy of Sciences. Member of Plant Ecology Branch, the Chinese Association of Botany; Used to be China-MAB Committee, UNESCO (2000-2008); Member of Urban Working Group, MAB, UNESCO (2000-2012). Study area: Plant Ecology, Plant Ecophysiology, Eco-agriculture. Have some 150 papers have been published both in China and abroad since 1985, among which 46 are the core journal papers in China, and 73 in SCI international journals papers.

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