Journal of Organic Systems 2007 2(1) 1-11

CHINA'S ORGANIC REVOLUTION

John Paull[1]
School of Geography & Environmental Studies, University of Tasmania, Australia.

Abstract

China is at the onset of an organic agriculture revolution. From 2000 to 2006, China has moved from 45th to 2nd position in the world in number of hectares under organic management. China now has more land under organic horticulture than any other country. In the year 2005/2006, China added 12% to the world's organic area. This accounted for 63% of the world's annual increase in organic land, and China now has 11% of the world's organically managed land. The antecedents to China's Organic Revolution are examined, and reveal further growth potential in the Chinese organic sector. Longitudinal analysis of China's food production statistics reveals explosive growth, and the consequent capacity for export has implications for food exporting nations. China has adopted an innovative path, via Green Food, towards achieving an organic future. This transition strategy may be a model for other countries seeking a rapid expansion of organics. Food exporting countries can expect in future to have their chemi-agricultural produce competing with certified organic produce of China.

Keywords: Green Food, China, ecological agriculture, State Environmental Protection Administration (SEPA), China Green Food Development Centre (CGFDC), Organic Food Development Centre (OFDC), *certification, logos, no-public-harm food, innovation, offsets, conversion, transition, revolution.*

Introduction

China has two organic agriculture histories, a long one and a short one. Whereas the long one is millennial, the short one is revolutionary. King (1911) in *Farmers of Forty Centuries*, provided a window into the long history of organic farming in China. King described the use of strategies of crop rotation, inter-cropping, low external input production, and the implementation of zero waste (Paull, 2006). He reported that "prizes are awarded for the best compost heaps in each county" (King, 1911, ch. XVII) and he described an agriculture without toxic inputs or outputs.

The short history of organic agriculture in China is built on two foundations: firstly, the experience of the toxic legacy of the so-called Green Revolution (Kimbrell, 2002, Sun et al., 2005), and secondly, the many farmers, mostly poor and from small farms in remote areas, who were not party to that revolution. As Sanders (2006, p. 118) points out, at the end of the twentieth century "there still existed instances of organic farming in China, despite years of grain monoculture and the Green Revolution".

Aetiology and Ontogeny of a Revolution

The new embrace by China of Organic Agriculture has been dramatic. For example, from 2005 to 2006 there was an eleven-fold increase in land reported under organic management; from 298,990 hectares to 3,466,570 hectares (Willer & Yussefi, 2005;

[1] Address: School of Geography & Environmental Studies, University of Tasmania, Private Bag 78, Hobart, TAS 7001, Australia, <jvpaull@utas.edu.au>.

Willer & Yussefi 2006; Fig. 1). This increase has catapulted China from sixteenth in 2005 to second in the world in 2006, for organic hectares, with 11% of the world total. Australia is first with 38% of the world's organic hectares (Willer & Yussefi, 2006), most of that being sparsely stocked grazing land (McKinna, 2006). The two largest markets for organic produce are Germany and USA (Willer & Yussefi, 2006). China's current organic area is four times USA's organic hectares, and four and a half times that of Germany (Willer & Yussefi, 2006; Fig 2).

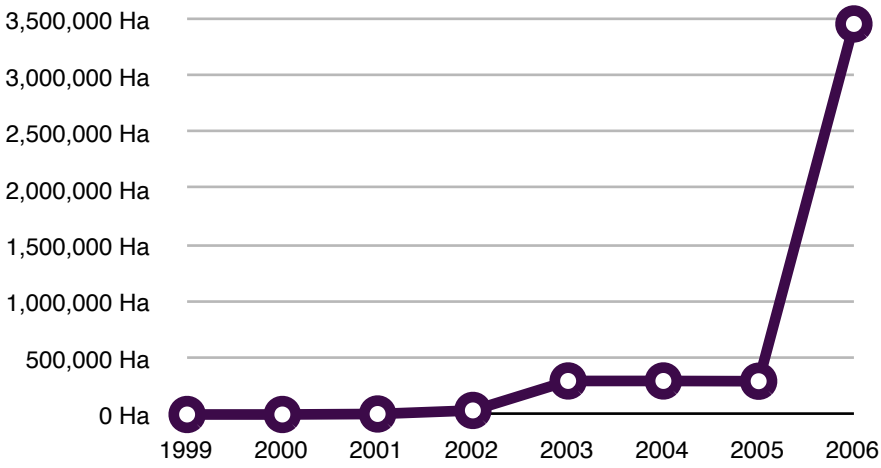

Fig.1.Organic Hectares in China 1999 to 2006; no data available prior to 1999. (Data sources: Willer & Yussefi, 2000a; Willer & Yussefi, 2000b; Willer & Yussefi, 2001; Yussefi & Willer, 2002; Yussefi & Willer 2003; Willer & Yussefi, 2004; Willer & Yussefi, 2005; Willer & Yussefi, 2006).

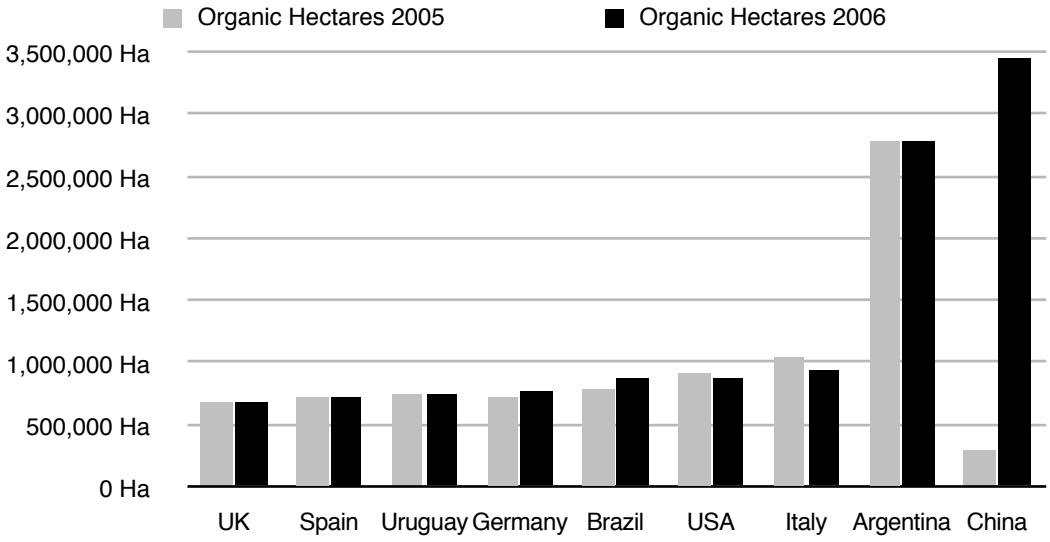

Fig 2. Total area under organic management, 2005 & 2006 for top organic countries, #2 to #10. Australia is #1 with 12,126,633 Ha in 2006 and 11,300,000 Ha in 2005, of which most is low intensity cattle grazing country. (Data from: Willer & Yussefi, 2005; Willer & Yussefi, 2006).

The 2005/2006 organic expansion in China added 12% to the world's area of land under organic management, and this accounted for 63% of the world's increase in organic land. Consequently, China's Organic Revolution has put it at the forefront of the worldwide organic movement, with now, most likely, more organic farmers and more land under organic horticulture than any other country.

Chinese wisdom declares that "there are many paths to the top of the mountain" (Andrews, 1996) and, as we shall see, China has discovered a new and different path up the organic mountain; assuming we accept that the organic journey is a metaphorically upward journey, and perhaps accept that at least for some of its history, this journey could truly be characterised as carrying manure up hill.

It is instructive to look at the aetiology and ontogeny of China's journey from 45th in world organic hectares in 2000, to 2nd in the world in 2006. According to Zong (2002, p. 55): "Organic agriculture in China has a very short history. It can be dated to 1990". By 2004, "the organic market" in China was reported to be valued at A$10.7 billion, compared to the US total market value of A$14.7 billion and the European value of $17.3 billion (Leu, 2006, p.2). The International Federation of Organic Agriculture Movements, with a total of 750 members from 108 countries, by 2005 had 48 member organizations from China, second only to Germany's 78 members (IFOAM, 2005).

China has just 8% of the world's farmland, 23% of the world's population (Li, 2005), and food production statistics that are best described as a J-curves (see Figures 3, 4, 5, 6, and 7).

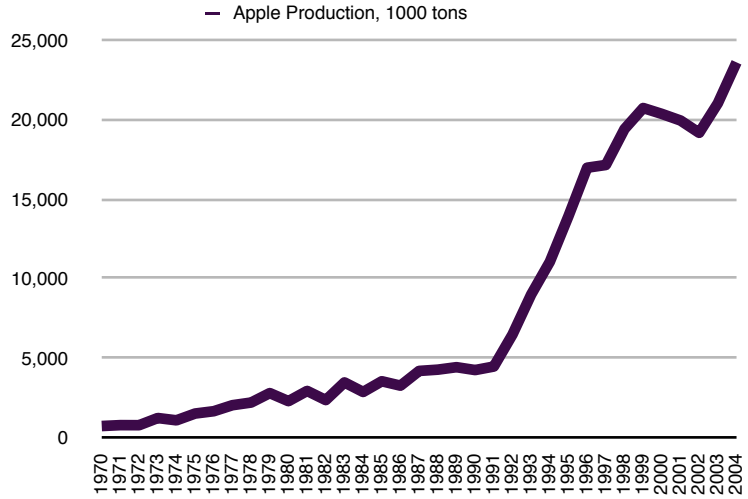

Fig. 3: China annual apple production figures, 1970 to 2004. (Data source: USDA Economic Research Service, 2006).

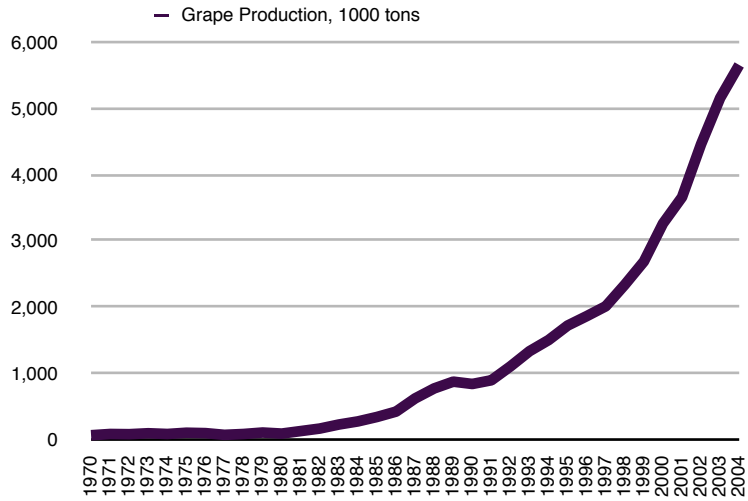

Fig. 4: China annual grape production figures, 1970 to 2004. (Data source: USDA Economic Research Service, 2006).

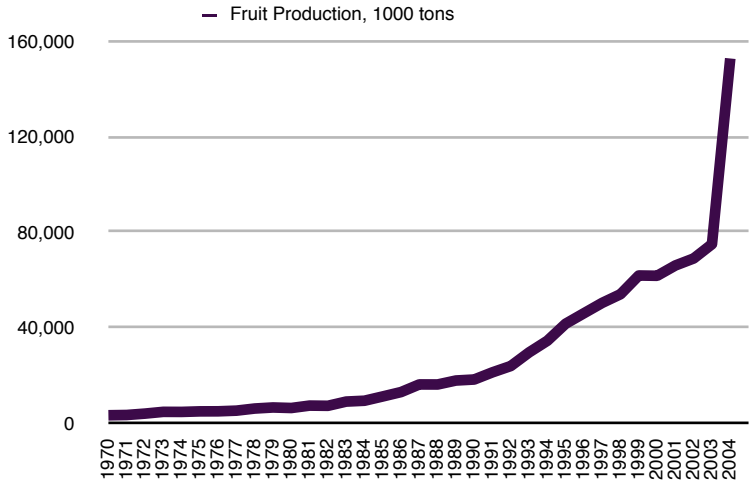

Fig. 5: China annual fruit production figures, 1970 to 2004. (Data source: USDA Economic Research Service, 2006).

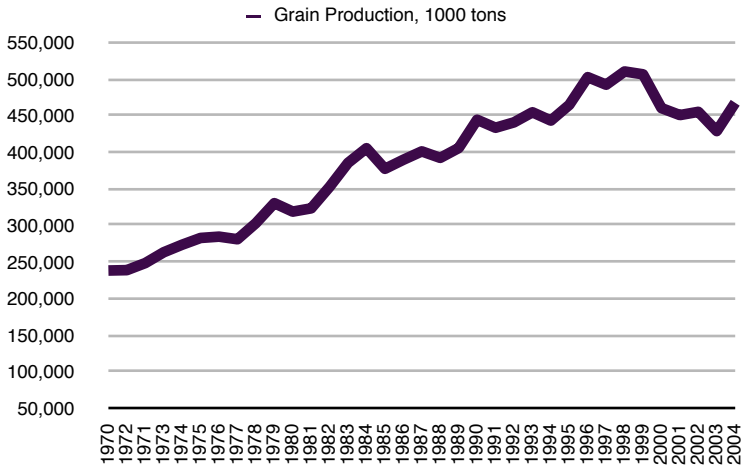

Fig. 6: China annual grain production figures, 1970 to 2004. (Data source: USDA Economic Research Service, 2006).

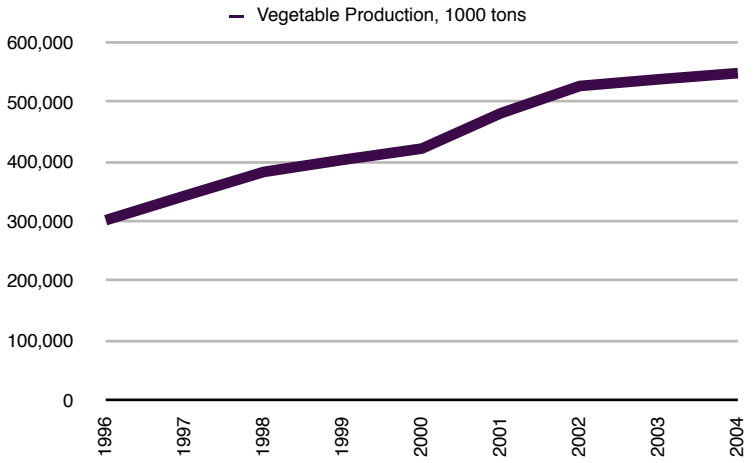

Fig. 7: China annual vegetable production figures 1996 to 2004. (Data source: USDA Economic Research Service, 2006; no data available prior to 1996).

Over the past 35 years, China has rapidly expanded its agricultural output. Since 1970, corn production has increased by 294%, peanut production by 568%, banana

production by 3548%, citrus production by 6080%, grape production by 6576%, and total fruit production by 3996% (USDA, 2006).

These figures are all the more remarkable when we consider that in China “farmland per capita is only 1/3 of the world’s average level” and water resources are only 1/4 of the world average level (Li, 2005). The flip side of China’s trajectory, is what Australian producers have dubbed their “crisis” (AusVeg, 2005), with imports to Australia of fresh vegetables from China up 43% (AusVeg, 2006a) and a reported “continual decline of exports” from Australia (AusVeg, 2006b).

In 2005, China produced 49% of the world’s vegetables, up from 36% in 1995 (McKay, 2006; Fig. 8), and 50% of the world’s apples (Skorburg, 2001). China is the world’s largest producer of pears, accounting for 60%, soon to be 70%, of world production (USDA/FAS, 2006a). China is the “world’s largest tomato paste and puree exporter” (USDA/FAS, 2005, p. 1). China produces 49% of the world’s apple juice exports, with other countries’ production levels shrinking, continuing a ten year downward trend for US production, and a similar decline for Germany with an expected 40% reduction in 2006 (FAS/USDA, 2006b).

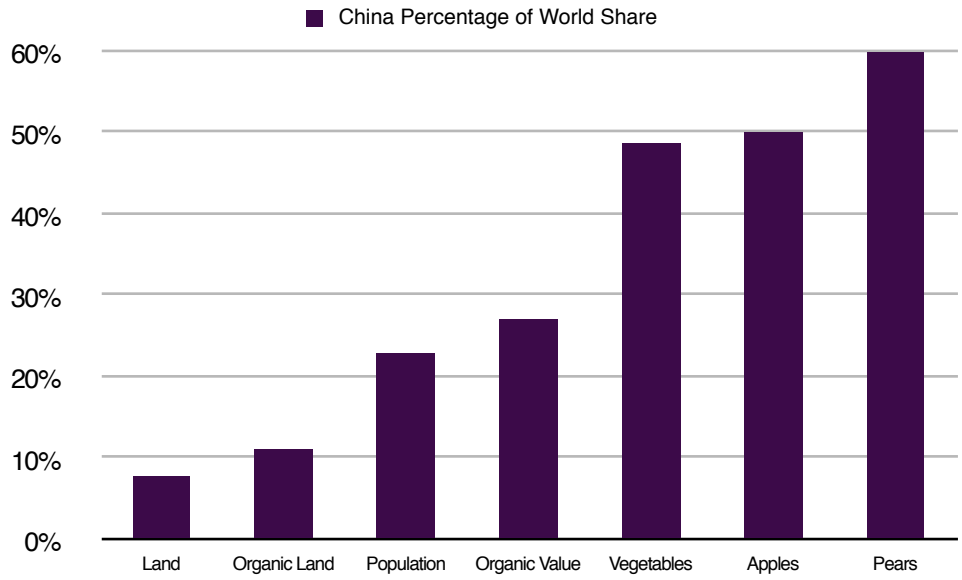

Fig. 8: China with 8% of the world’s land and most of the world’s farmers, produces 60% of the world’s pears (Data sources: Li, 2005; Willer & Yussefi, 2006; McKay, 2006; Skoburg, 2001; USDA/FAS, 2006).

China’s food production surge has extracted a considerable toll. Environmental degradation, farmer and consumer health compromises, and international resistance to Chinese-grown food, are the three issues that have focussed the greatest attention on the need to address the dysfunctions of the Green Revolution in China, and the need to develop agricultural alternatives. “Poisoned food” (Zong, 2002, p. 55), farmer deaths from pesticide poisoning (Giovannucci, 2005), and consumer deaths from consuming farm produce (McKinna, 2006), are stories that are readily grasped, reported and relayed, even in a totalitarian state. Pesticide residues keep Chinese tomatoes off the menu of Japanese householders (Latner & Lei, 2006). Although China currently only exports 2% of its vegetable production (McKay, 2006), such bans have the potential to hurt all Chinese agriculture just at a time when it is anxious to increase export earnings.

"The government has seen organic farming as an effective way to face the challenges of international trade barriers" (Chen, 2006, p. 17).

A milestone for organic agriculture in China was the March 2001 speech by Communist Party General Secretary, Jiang Zemin, to China's top leaders urging a "vigorous adjustment of agricultural structure", and urging that "top priority" be given to "establish quality standards for farm produce, a move to a system for examining and testing farm produce and to develop organic and pollution-free food" (People's Daily, 2001); this may be regarded as a Chinese epiphany of Kirkpatrick's (2006, p.98) "there is not much of a long term future in industrial agriculture".

In the 1980s an early step towards organics was the development by the government of "Chinese ecological agriculture (CEA)", *zhongguode shengtai nongye* (Sanders, 2006, p. 117). The government "prescribed its technical features, to include specific limits on the inputs of chemicals", yet there was "only limited success in persuading farmers to adopt CEA *per se* in the 1980s" (Sanders, 2006, p. 117). By 1990 there were however, 1200 eco-villages, "pilot ecological agriculture villages", in China, (Zong, 2002, p. 54).

In 1990, the Ministry of Agriculture created the Green Food program (Mei et al., 2006). Green Food has been a remarkably successful Chinese innovation in quality food production, and this has subsequently paved the way for China's Organic Revolution. Because of its success, it is a strategy that could be considered for replication elsewhere.

That same year, 1990, witnessed the birth of China's fledgling certified organic industry. Green tea, certified by the Dutch certifier SKAL, and shipped to the Netherlands, was China's first certified organic export (Zong, 2002).

Green Food is a government food certification program created to bring to market *San Pin* or "no-public-harm food" (Chen, 2006). This was achieved by creating a regime of produce testing, networks of inspectors and testing stations, a schedule of farm inspection and certification procedures, as well as fees, a Green Food logo for use on certified produce, a premium price structure, and a public awareness program. In contrast to the traditional organic agriculture approach, the emphasis for the Green Food program was always on the product and the outcome, rather than on the process. Green Food is administered by China Green Food Development Centre (CGFDC), which is under the control of the Ministry of Agriculture (MoA). It has been marketed as "high quality and pesticide-controlled food" (UNESCAP, 2002, p. 5).

The Ministry of Agriculture, *via* the CGFDC, owns the Green Food label in China. By 2003 there were more than 3000 products, with certified land of 5.14 million hectares. Retail sales "make Green Foods one of the largest such sectors in any country of the world, approximating the retail value of the United States USD 12 billion organic market", and in 2003 approximately US$1.2 billion was exported to Japan and Europe (Giovannucci, 2005, p. 10).

Green Food is a Chinese innovation which certifies food safety by certifying product standards. In addition to residue testing, it includes field inspections and inspections of processing procedures. There are also tracking and traceability systems in place, including "electronic identification" systems (Chen, 2006).

Concurrently with Green Food developments, in 1994 China's State Environment Protection Administration (SEPA) set up the Organic Food Development Centre (OFDC)

(Sanders, 2006). There were two motives for this move: the “high potential for high-quality exports”, and “to encourage innovative farming practices that allowed for a more environmentally sustainable agriculture”(UNESCAP, 2002, p. 5). From the outset, OFDC focussed on complying with international organic standards. Thus from the outset MoA’s Green Food program, and SEPA’s Organic food program were based on divergent philosophies; the former concentrating on product certification, to Chinese specifications, and excluding neither GMOs (Zong, 2002) nor pesticides, and the organic certification concentrating on process certification, and harmony with international organic standards.

In 2002 OFDC was “finally given full accreditation by IFOAM ... Chinese organic products certified by OFDC can be sold in the lucrative and growing markets around the world” (Sanders, 2006, p. 119). The International Federation of Organic Agriculture Movements (IFOAM) is based in Bonn, Germany and a certifier requires IFOAM accreditation to have international market credibility. IFOAM certification procedures include a three year in-conversion period for farms converting to organics.

The innovation of the Chinese experience has been to set up a local standard, the Green Food standard, and proliferate it, test it, hone it out of the international spotlight, and to then differentiate certification into Grade A, and Grade AA, and then to incrementally converge the local Green AA standard with internationally accredited organic standards.

This strategy has facilitated the rapid uptake of organics in China. Green Food Grade A “will be the de facto basis of all Chinese agriculture” and the Green AA standard will “be phased out in favour of organic certification” (Giovannucci, 2005, p. 34). This successful strategy of articulating from the national Green Food AA certification to the international organic standard certification, is a model that other producer countries could learn from, and possibly emulate. For example, Australian vegetable growers are introducing a new national, though optional, standard “EnviroVeg” (Whitman, 2006); perhaps “green” was seen as going a little too far? In any event, this initiative, if pursued with integrity rather than puffery, could be used as a stepping stone for the industry to convert to organic.

Pesticide use in China peaked in 1982 at 1,582,000 tons (Fan, 1997) and dropped to 1,312,000 tons in 2003 (ZHB, 2004). China’s imports of biocides cost US$620,565,000 in 2004, compared to Australia’s US$530,256,000 (author’s aggregations of FAOSTAT data, 2006).

Machinery input in Chinese farming grew sixteen times in the 25 years between 1970 to 1995, from 22 billion watts to 361 billion watts (Fan, 1997). The total power of agricultural machinery grew by a factor of 28, from 1970 to 2003, with government subsidies covering 20% to 40% of the costs of new machinery. While farm mechanization is “still in the elementary stage”, the government has adopted “the mechanization of agricultural production as one of its vital strategic targets” (Li, 2005, p. 1). China is currently manufacturing approximately 2 million new tractors per year (from figures in Li, 2005).

Green Food specifications and certification of product, is quite different to, but in no way incompatible with, Organic certification, which certifies process. By building infrastructure for Green Food standards, the incorporation and/or migration to Organic process standards is facilitated, and adoption of these twin standards has the potential to raise the bar, so that Chinese Organics are of the highest international standard.

The uptake of organics in China has been rapid. China's State Environmental Protection Administration (SEPA) issued *Organic Food Certification and Management Measures* in 2001 (Giovannucci, 2005). In 2005 the newly formed Certification and Accreditation Administration of China (CAAC) issued the first national standard: the *Chinese National Standards for Organic Produce* (Mei et al., 2006), and thereby controlled and restricted the use of the term "organic" to certified produce (Bugang, 2005). Eight key differences between the European and the Chinese model of Organic Agriculture are presented in Table 1.

EU OA model	China OA model
Local market focus	Export market focus
Bottom-up history	Top-down history
Ideology driven	Price driven
Individual farm certification	Group certification
Farmer as decision maker	Co-op/enterprise as decision maker
Direct conversion process	Conversion via Green Food
Native idea	Foreign idea
Farm as organism	Farm as economic enterprise

Table 1: Eight key differences between the Chinese and European experience of Organic Agriculture (OA).

Discussion & Futures

For Chinese farmers, the issues of converting to organic, are as for farmers elsewhere. These include that chemical inputs are expected to decrease, labour inputs are expected to increase, yields may decline, especially in the three year conversion period, costs are involved in inspection and certification, there is the nuisance value of additional paperwork, uncertainty concerning markets and premiums for the produce, the probable lack of a premium during the conversion period, and health and farm environmental benefits from eliminating pesticides.

Two key attractions of organics for China are "lower production costs and higher prices" (Mei et al., 2006, p.5); and so organics can be a tool to alleviate rural poverty (Giovannucci, 2005). There have been many studies, in a range of countries, of the economics of conversion. The International Fund for Agricultural Development and the United Nations advocate conversion to organics as a strategy of alleviating poverty in third world countries (Giovannucci, 2005; Hak-Su, 2002). Economics may dominate the convert-or-not decision process for third world farmers: "receiving greater income is by far the most important reason given by farmers for converting" (Giovannucci, 2005, p. 57), and improved profits are reported as the major driver of organic conversion in China (Sanders, 2006). Igual & Izquierdo (2001) present an analysis methodology of the economics of organic production (in Europe) under a variety of premium and input cost

assumptions. Zong (2002) presents a case study analysis of rice production in China and reports a net 51% improvement in profitability after conversion.

China's first eco-village, Liu Min Ying, won a UN environmental protection (UNEP) award in 1987. It is an organic village that has prospered, and has branched out into eco-tourism and eco-training, and is now "one of the richest villages in the Beijing Municipality" (Sanders 2006, p. 127).

One other factor may be increasing the attractiveness and uptake of organics in China. There is a farm offsets system in place in 24 provinces. Where an urban or industrial development is proposed for farmland, there is a planning approval requirement, to offset that loss of farmland by bringing an equivalent area of new farmland into production (ZHB, 2004). This requirement, which favours the adoption of more remote (and hence cheaper) sites for farmland recovery, can dovetail with organic development needs whereby "government and investors chose remote and underdeveloped areas in the mountainous region, where manufacturing, pollution or contamination is relatively low" (Chen, 2006, p. 12).

As of 1 April 2005, there is only one organic label for all of China and for all products. It is bilingual, Chinese and English, and there are two versions "Organic" and " Conversion to Organic" (Chen, 2006; Figure 9); the word "organic" is now restricted for use only on certified produce. This is expected to substantially resolve the confusion, identified by Wong (2005), in the domestic Chinese market caused by the proliferation of labeling variations, and the reported substantial amount of "self-claimed organic" i.e. non-certified organic.

Fig. 9: New Organic logos introduced 1 April 2005 to replace the previous proliferation of labels.

The newly developing Shanghai suburb of Dongtan is designed to be home to 500,000 residents and to be surrounded by forest and organic farms, to be "zero-pollution", and powered by renewable energy (Pearce, 2006). Dongtan, with its organic farming integration and gardens on roofs, has been described as "the world's first purpose-built eco-city" (Allenby, 2006, p. 15).

China is another strand of what Alroe & Noe (in press) describe as "the heterogeneous trends and patterns in the development of modern organic agriculture". Rahman & Nieberg (2005) report that the main reasons given by German farmers for conversion to organics, were environmental (38%), economic (29%) and political (20%). It is an interesting question for future research to examine the political motivations in China for conversion to a system of agriculture that is an open (public-domain) system, compared to increasingly proprietary, chemical and patented, agribusiness options.

China may be the newest organic 'kid on the block', but she is a very serious player with the potential to greatly raise the market presence and profile of Organics around the

world. Wai (2006, p. 112) describes the “Chinese national standards” as “the most stringent set of organic requirements in the world”. Mei et al. (2006) report that “It is expected that by 2010 over one third of the total agricultural land in production will be converted to organic production” (p. 4), and that “China is well on the way to becoming one of the largest organic food producers in the world” (p. 5). There is the potential for China to redefine the standard for internationally traded food, as certified organic.

References Cited

Allenby, G. 2006, China signals end to smogopolis growth, *The Australian*, Prime Space, 6, July, 15-16.

Alroe, H. & Noe, E., in press, What makes organic agriculture move - protest, meaning or market? A polyocular approach to the dynamics and governance of organic agriculture, *International Journal of Agricultural Resources, Governance and Ecology*.

Andrews, R., Biggs, M. & Seidel, M. 1996,*The Columbia world of quotations*, Columbia University Press, New York.

AusVeg, 2006, Industry in crisis, *Vegetables Australia*, 1 (2), Sept/Oct, 11-19.

AusVeg, 2006a, *Origin of Australian imports*, AusVeg, Melbourne, June.

AusVeg, 2006b, *Destination of Australian exports*, AusVeg, Melbourne, June.

Chen, U. 2006, *South China organic food market brief*, USADA Foreign Agricultural Service, Guangzhou.

FAOSTAT data, 2006, *Agriculture Data*, Food and Agriculture Organization of the United Nations, available at <faostat.fao.org>.

Giovannucci, D. 2005, *Organic agriculture and poverty reduction in Asia: China and India focus*, International Fund for Agricultural Development (IFAD), Rome.

Hak-Su, K. 2002, *Organic agriculture and rural poverty alleviation, Potential and best practices in Asia*, United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), Bangkok.

IFOAM, 2005, *List of members, Organic directory online*, International Federation of Organic Agriculture Movements (IFOAM), Bonn, available at <www.ifoam.org>.

Igual, J. & Izquierdo, R. 2001, *Economic and financial comparison of organic and conventional citrus-growing systems in Spain*, Food and Agriculture Organization of the United Nations (FAO), available at <www.fao.org>.

Kimbrell, A., 2002, *The fatal harvest reader, the tragedy of industrial agriculture*, Island Press, Washington.

King, F. 1911, *Farmers of forty centuries, or Permanent agriculture in China, Korea and Japan*, Mrs F. H. King, Madison, Wisconsin, available at <www.gutenberg.org>.

Kirkpatrick, J. 2006, *The ecologies of paradise, Explaining the garden next door*, Pandani Press, Hobart.

Latner, K. & Lei, A., 2006, Peoples Republic of China, Tomatoes and Products, *GAIN Report*, No. Ch6024, USDA Foreign Agricultural Service, May 15.

Leu, A. 2006, Continued growth, *Organic Update*, July 2006, Organic Federation of Australia, available at <www.ofa.org.au>.

Li, S. 2005, Agricultural mechanization promotion in China - current situation and future, Agricultural Engineering International, *CIGR Journal of Scientific Research and Development*, VII, 1-17.

McKay, A. 2006, Update on China and the world carrot market, *WA Grower*, 36(1),6-10.

McKinna, D., 2006, *Export potential for organics, opportunities and barriers*, RIRDC, Canberra, Australia, June.

Mei, Y., Jewison, M. & Greene, C. 2006, Organic products market in China, USADA Foreign Agricultural Service, GAIN Report, CH6405, June.

Paull, J. 2006, Permanent agriculture: precursor to organic farming, Elementals, Journal of Bio-dynamics Tasmania, 83, 19-21, available at <www.orgprints.org/10237>.

Peoples Daily, 2001, Central economic working conference held November 27 to 29, *Peoples Daily*, Beijing, 30 November, available at <english.people.com.cn>.

Pearce, F. 2006, Master plan, *New Scientist*, 2556, 17 June, 43-45.

Rahmann, G. & Nieberg, H. 2005, New insights into organic farming in Germany - empirical results of a survey in 218 farms, *Landbauforschung Volkenrode*, 3 (55) 193-202.

Sanders, R. 2006, Organic agriculture in China: do property rights matter? *Journal of Contemporary China*, 15 (46) Feb, 113-132.

Sun, S., Zhao, J., Koga, M., Ma, Y., Liu, D., Nakamura,M., Liu, H., Horiguchi, H., Clark, G. C. & Kayama, F. 2005, Persistent organic pollutants in human milk in women from urban and rural areas in northern China, *Environmental Research*, 99 (3), 285-293.

UNESCAP, 2002, *Report of the regional workshop on exploring the potential of organic agriculture for rural poverty alleviation in Asia and the Pacific*, United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), Chiang Mai.

USADA, 2006, *China agricultural and economic data: National data results*, United States Department of Agriculture Economic Research Service, available at <www.ers.usda.gov>.

USDA/FAS, 2005, World tomato and tomato products situation and outlook, United States Department of Agriculture, *FAS Attache Report*, August.

USDA/FAS, 2006a, *World pear situation*, United States Department of Agriculture Economic Research Service, March, available at <www.fas.usda.gov>.

USDA/FAS, 2006b, *World apple juice situation*, FAS/USDA, May.

Wai, O.K. 2006, Organic farming in Asia, in Willer, H. & Yussefi, M. 2006, *The world of organic agriculture: Statistics and emerging trends*, International Federation of Organic Agriculture Movements (IFOAM), Bonn.

Whitman, H. 2006, Where to with environmental issues facing the vegetable industry, *Australian Vegetable Industry Conference*, Brisbane, May.

Willer, H. & Yussefi, M. 2000a, *Organic agriculture world-wide: Statistics and perspectives*, Stiftung Oekologie & Landbau (SOEL), Bad Durkheim, February.

Willer, H. & Yussefi, M. 2000b, *Organic agriculture worldwide: Statistics and future prospects*, Stiftung Oekologie & Landbau (SOEL), Bad Durkheim, August.

Willer, H. & Yussefi, M. 2001, *Organic agriculture worldwide: Statistics and future prospects*, Stiftung Oekologie & Landbau (SOEL), Bad Durkheim.

Willer, H. & Yussefi, M. 2004, *The world of organic agriculture: Statistics and emerging trends*, International Federation of Organic Agriculture Movements (IFOAM), Bonn.

Willer, H. & Yussefi, M. 2005, *The world of organic agriculture: Statistics and emerging trends*, International Federation of Organic Agriculture Movements (IFOAM), Bonn.

Willer, H. & Yussefi, M. 2006, *The world of organic agriculture: Statistics and emerging trends*, International Federation of Organic Agriculture Movements (IFOAM), Bonn.

Wong, J. 2005, A survey of “organic food” labeling in Hong Kong, *15th IFOAM Organic World Congress*, Adelaide, September.

Yussefi, M. & Willer, H. 2002, *Organic agriculture worldwide: Statistics and future prospects*, Stiftung Oekologie & Landbau (SOEL), Bad Durkheim.

Yussefi, M. & Willer, H. 2003, *The world of organic agriculture: Statistics and future prospects*, International Federation of Organic Agriculture Movements (IFOAM), Tholey-Theley.

ZHB, 2004, *Report on the state of the environment in China 2003*, State Environmental Protection Administration (SEPA), Beijing, available at <www.zhb.gov.cn>.

Zong, H. 2002, *The role of agriculture and rural development in China, in: Organic agriculture and rural poverty alleviation, Potential and best practices in Asia*, United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), Bangkok.