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The Greening of China's Food - Green Food, Organic Food, and Eco-labelling

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Abstract

China is rapidly adopting, adapting and developing green technology and ideas. China is now a world leader in organic production and this can have implications for world food production. This paper examines the rapid rise of green food and organic agriculture in China, the multiple motivations that have driven it, and the innovative implementation strategies underpinning it. The first organic export from China was in 1990. The Chinese national organic standard and national organic logo were established in 2005. Thirty eight certifiers now operate in China servicing both domestic and export markets. While "Organic" is still poorly understood in the Chinese domestic market, "Green Food" is well known and readily available. Green Food is a Chinese innovation and dates from 1990. The China Green Food Development Centre was founded in 1992 to oversee the implementation of this food production innovation. Certification for Green Food production involves the regulation of inputs, with the objective of reduced use of pesticides, the oversight of production, and the residue testing of the produce. This Green Food strategy has been used as a "half-way house" between chemical food and organic food production. In 1995 Green Food certification was split into Grade A and Grade AA. It is this bifurcation of Green Food standards that laid the groundwork for the rapid articulation from Green Food certification to organic certification, and thus enabled the reported dramatic ten-fold increase in organic hectares in China in 2006 - and thereby placed China second in the world in terms of hectares under organic management, after only Australia. Longitudinal data are examined to reveal China's organic and green trajectories, and potential future scenarios are presented. The new phenomenon of Chinese certified organic produce raises many questions. Data is presented to illuminate what role country of origin labelling (CoOL) might play, now and in the future, in a world market that is wary of Chinese food quality. China has gone well beyond being an adopter of organic concepts, and is now an active organic innovator - how successful and how exportable might these innovations be? Is the development of Chinese organics a threat or an opportunity, and for whom?

Keywords: China, organic farming, organic agriculture, organic food, green food, hazard-free food, pollution-free food, China Green Food Development Center, CGFDC, F H King, eco-agriculture, eco-food, eco-labelling, eco-labeling.

China as an Agricultural Exemplar

What has China to teach the west about food production? A century ago Professor F. H. King visited China as an early agricultural eco-tourist. He had recently had a falling out with the United States Department of Agriculture (USDA) (Paull, 2006a) and he had come "to learn how the old-world farmers had been able to provide materials for food and clothing on such small areas for so many millions, at so low a price, during so many centuries" (King, 1911, p.60). He was keen "to see them at the soil and among the crops" (p.60). He reported "How thorough is the tillage, how efficient and painstaking the garden fitting, and how closely the ground I crowded to its upper limit of producing power" (p.67). He wrote "it remains for us to profit by their experience, to adopt and adapt what is good in their practice and help in a world movement for the introduction of new and improved methods" (p.274).

King 's book was cited as a reference in Northbourne's manifesto of organic agriculture (Northbourne, 1940) and it's place in the corpus of organic literature is reflected in Dover Publications reprint where in the subtitle "Permanent Agriculture in China, Korea, and Japan" has been replaced with "Organic Farming in China, Korea, and Japan" (King, 2004). King in 1911 called for "a world movement". Is China's development and implementation of Green Food just such an "improved method" as King

sought and might it be adopted more broadly? A century after King's visit can China's agricultural strategies once again be an exemplar to the world?

Who will feed China?

"Who will feed China?" asked Brown (1995). The Chinese government responded: "Some foreigners once raised the question 'Who will feed China?' China's leaders and agricultural experts reply was, 'We Chinese will feed ourselves'" (China Factfile, 2006).

China's Ministry of Agriculture (MOA, 2004, p.1) refers to "the wonder of supporting 21% of the world's population with less than 9% of the world's arable land". China is a net food exporter based on both volume and value (Table 1). The Unit Pricing Coefficient (cost per million tons) presented here demonstrates a China policy of: "sell high, buy low" (Table 1).

2006	Exports	Imports
Quantity (million tons)	24.173	20.273
Value (US$ billion)	26.659	13.396
Unit Pricing Coefficient*	1.103	0.661

Table 1: China's food exports exceed imports by 19.2% by weight, and by 99% by value
(Data source: SCIO, 2007). *Unit Pricing Coefficient is the price in US$ Billion per million tons of product.

China's stated objective is "securing food security by relying on its own resources" (MOA, 2004, p.31). "China can fully rely on itself … We will not leave the food issue to the world" (MOA, 2004, p.21). Within this policy of self sufficiency and security, China engages as a serious global food trader. "China has become one of the main food traders in the world. The high export competitiveness of Chinese food and processed food products has been achieved mainly by lower production costs" (Lu, 2005, p.8).

The top five countries, ranked by value, that China exports food to are: Japan, USA, South Korea, Hong Kong and Russia . The top five sources, ranked by value, of China's food imports are: Malaysia, Russia, USA, Indonesia and Argentina (SCIO, 2007).

The figures for China's food production are impressive by any standards, and they are a source of focus and pride for the government: "China has made a miracle in agricultural growth" (MOA, 2004, p. 22). China produces 47% of the world apples (Foster, 2005), 49% of the world's vegetables (McKay, 2006), and 60% of the world's pears USDA/FAS, 2006)

China claims it has more farmers than any other country (MOA, 2004, p.18). In the current five year plan, China plans for a 4% increase in population, and a 1% decrease in agricultural land (Yan, 2006). The plans of the Ministry of Agriculture are to increase food production and yields, while taking a small percentage of land out of production (MOA, 2004). The MOA (2004, p.20) has identified that "the deterioration of eco-environment is of great concern to us". They calculate that 9 million hectares (7.4% of the total cultivated land) is "suffering from agricultural chemical contamination" (p.20). (For readers referring to original Chinese sources: 15 mu = 1 hectare = 2.47 acres).

An objective of the 11th five year plan is to "increase farmers' income" (NRDC, 2006, Ch.2). There is currently a substantial gap between rural-dweller and urban-dweller incomes, which is a potential source of social unrest and creates an incentive for rural to urban migration.

Eco-Food in China

China has 34.18 million hectares of eco-food production (Fig.1); this compares to the world total of 30.42 million hectares for certified organic agricultural land (Willer, Yussefi-Menzler & Sorensen,

2008). China's total eco-labelled food production area is 28% of China's total of 122 million hectares of agricultural land (Table 2).

China 2007	Organic	Green	Hazard-free	TOTAL
Products	2647	14339	28600	45586
Enterprises	600	5315	24600	30513
Million Hectares	3.11	10	21.07	34.18
% of Cultivated Ha (China ∑=122 m ha)	2.5	8.2	17.3	28.0
% of Eco-food Ha (China ∑=34.18 m ha)	9.1	29.3	61.6	100
Million Tons	19.56	72	est. 152[1]	est. 243.56
Productivity tons/ha	6.3	7.2	est. 7.2	est. 7.1
Farmgate[4] Value US$B	est. 5.6 - 10.2 [2]	20.7	est. 29.1 - 39.7[3]	est. 55.4 - 70.6

Table 2: Eco-agriculture statistics. (est. = estimated; [1] assumes the tonnage per ha of Green and Hazard-Free are equal; [2] lower bound estimate based on 19.56 tons of Organic valued at the same premium as Green Food, i.e. using the upper bound of premium range for Green Food (10% -50%) and the lower bound for the premium for Organic (50% - 100%) ; [2] upper bound estimate based on 19.56 tons of Organic using the lower bound of premium range for Green Food (10% - 50%) and the upper bound for the premium for Organic (50% - 100%); [3] devalued based on Green Food achieving premiums of 10% - 50% over Hazard-Free; [4] Giovannucci, 2005, p.10). (Data sources: Hongbin, 2007a; SCIO, 2007; Yan, 2006).

There are three food categories in China that carry certification, and thus have some claim to being eco-food or eco-labelled food (Table 2). The Ministry of Agriculture (MOA) oversees these three separate certification schemes. Two of these are Chinese standards, Green food and Hazard-Free food, and the third, Organic food, is certified to international standards. The Organic food sector is jointly overseen by the Ministry of Agriculture (MOA) and the State Environment Protection Agency (SEPA). Some statistics and comparisons will be presented for each of these three schemes, however this paper will focus mostly on the phenomenon of Green food and its articulation to Organic.

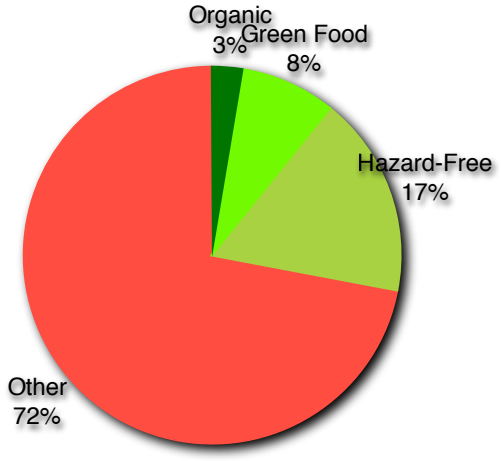

Figure 1: Distribution of Organic, Green Hazard-Free relative to the total (122 m ha) supply of cultivated land in China. (Rounded to nearest whole number %); (Data sources: Hongbin, 2007a; Yan 2006).

China reports a total of 122 million hectares of agricultural land (Yan, 2006). Organic certified hectares represent 2.5% of of China's total agricultural land, Green food is 8.2%, and Hazard-free food is

17.3% (Fig.1). Of the total of 34.18 million hectares of eco-food production, Organic represents 9.1%, Green food 29.3% and Hazard-free food represents 61.6% (Fig.2).

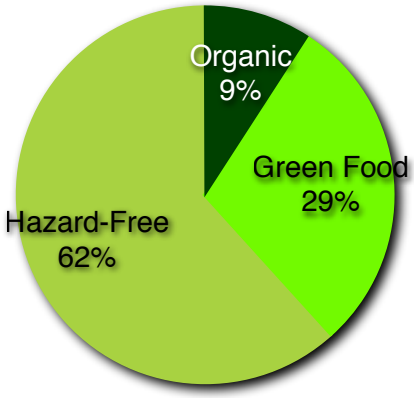

Figure 2: Three styles of China eco-labelling, by hectares (Data source: SCIO, 2007).

Green food and Organic food both exhibit bilingual logos - in English and Chinese (Table 3). After almost two decades of market presence, Green food is well represented, clearly labelled, and easily found in food market places in China. Green food appears to be a well understood and recognised concept amongst Chinese consumers.

Green Food logo	Organic & Organic In-Conversion logos
绿色食品 Greenfood	中国有机产品 ORGANIC　中国有机转换产品 CONVERSION TO ORGANIC

Table 3: Chinese Green Food and Organic logos.

Lianfu (1999, p.15) of the China Green Food Development Centre explained the genesis of Green Food: “China’s green food development is the outcome of actively exploring new ways of food production and consumption based on China’s own situation and in line with the international trend of sustainable development”.

Both Green food and Organic food in China have their beginnings in 1990. In that year the MOA created the Green Food program (Aiguo, 2005, p.1). Also in 1990, China’s first organically certified tea, certified by Dutch certifier SKAL, was exported (Zong, 2002). The China Green Food Development Centre (CGFDC) was founded in 1992, under the auspices of the MOA, to be “responsible for national development and management of Green Food” (Aiguo, 2005, p.3). The CGFDC owns the logo, develops and maintains the standard, is responsible for certifications, coordinates inspections and monitoring, and draws income for certification fees. In 1993 CGFDC joined IFOAM (Lianfu, 1999). In 1994 SEPA established the Organic Food Development Centre (OFDC) and achieved accreditation by IFOAM in 2002 (Sanders, 2006). Concurrent with developments at the OFDC, the CGFDC split its certification into two grades A and AA “in the late 1990s” (Giovannucci, 2005, p.12). This was a strategy that recognised that Green Food “lays very good foundations for the development of organic food” ((Lijuan, 2003, p.19). Green Food Grade AA now excludes synthetic pesticides and fertilisers and is now harmonized with organic standards. Green Food thus provides farmers with a stepped pathway from chemical farming, to Green food Grade A through to organic certification. In 2005 the first Chinese national organic standard was

issued by SEPA (Mei et al., 2006) and new bilingual organic logos (organic and in-conversion) were released. These developments have lead to the rapid adoption of organic certification (Fig.3).

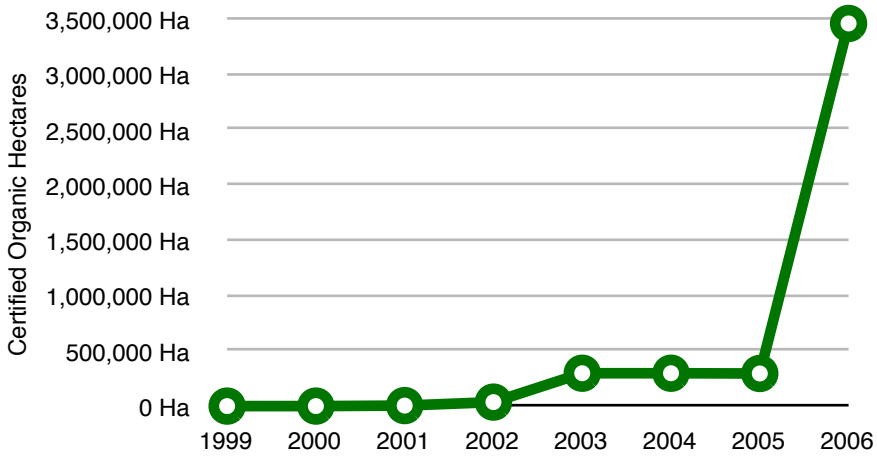

Figure 3: Certified Organic hectares in China (source of graph: Paull, 2007).

Organic food products are available in big city supermarkets, for example *Carrefours* in Shanghai, and there are supermarkets in both Shanghai and Beijing dedicated to organic food, e.g. *Lohao*. Nevertheless, organic is still a new concept and little understood by Chinese consumers. *Carrefours* stores in Shanghai have bilingual (Chinese and English) banners defining organic and describing its benefits. In contrast, the issue of pesticide residues and the dangers thereof seem to be well appreciated by Chinese consumers.

"Hazard-free food" labelling is monolingual, and is rendered variously in English translations with no uniform or standard translation. The three eco-foods are very frequently bracketed together, for example: "Hazard-free, green and organic products make up ..." (SCIO, 2007, 2(1)). Other English renderings of "hazard-free" include: "farm safe" (Hongbin, 2007a); "pollution-free" (MOA, 2004, p.12; Hongbin, 2007b); "safe agricultural product" (Hongbin, 2007b); and "bio-safety agricultural products" (Hongbin, 2007c).

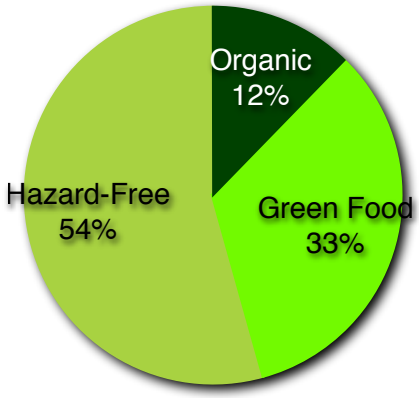

Figure 4: The distribution of three eco-agricultures in China, adjusted by value, cf. Fig.2.(Extrapolated from hectares data, assumes same product mix, adjusted by mid range price premiums of 30% for Green and 75% for Organic; Organic discounted by 12.5% to allow for productivity decrease).

Price Premiums of 10-50% are reported for Green food, and 50% to "several times higher" for Organic food (Youfu, 2002, p.3; Lijuan, 2003, p.16). The price premium reported for Green Food peanuts was 12%, and for certified Organic peanuts was 41%. The price premium reported for Green Food soybean was 10%, and for certified Organic soybean was 110% (Youfu, 2002, p.6). Both Youfu (2002) and Lijuan (2003) reported that there is a productivity difference under Organic, with output being "10 - 30% less". For Green food productivity was comparable to chemical agriculture, they cited Green productivity as the "Same or a bit less". The production figures for 2007 indicate an output difference,

based on tonnage per certified hectare, of 12.5% less under Organic management (Table 2). Figure 4 presents the relative importance of the three eco-foods based on value and under the stated assumptions. Further context and background of the development of Organic agriculture in China is presented in Paull (2007).

According to the Ministry of Agriculture 90% of China's agricultural exports are eco-food, either Hazard Free, Green or Organic (Hongbin, 2007a). Hongbin (2007a) states that Green food has been "recognized by over 40 trading partners" and that "in the past 5 years, export of green food has increased at a rate of over 40% per year".

Concurrently with pursuing these three eco-labelling options, China is also adopting international food standards. "The intention of the Chinese government is to require all enterprises of meat, vegetables, juice, fast food and fisheries products to obtain HACCP [Hazard Analysis Critical Control Point] certification by the end of 2006" (Lu, 2005, p.17).

Green Food

Green Food has been a remarkable innovation of food production and marketing. Giovannucci (2005, p.xxxiv) commented that: "China's certified Green Foods are one of the most successful eco-labelling programs in the world, because of their rate of growth in the past decade, their similarities to organics, and their sheer volume, and are well worth understanding since they set a precedent for organics". Green food production is a reduced input agriculture developing a balance between health, environment, economics and productivity (Table 4). Green Food products are sample tested for pesticide residues, and annual inspections are conducted (Giovannucci, 2005, p.12).

Cultivation requirements for Green Food certification
• *"Area should meet the highest grade of air standards in China".* • *"Heavy metal residues are restricted in irrigation, water and soil (tests for mercury, cadmium,arsenic, lead, chrome, etc.)".* • *"Processing water must meet the National Drinking Water Standard".* • *"Chemical applications are restricted and regulated, and some of the most poisonous pesticides and herbicides are banned".*

Table 4: Cultivation requirements for Green Food Certification (Source: Giovannucci, 2005, p.12).

Green food is a Ministry of Agriculture initiative. "In 1991, the MOA began to implement the strategy of "Green Food" in agro-food production in order to improve the health and environmental safety and market competitiveness of Chinese food products, as well as agricultural environmental sustainability" (Lu, 2005, p.17). Green food production for 2007 was valued at US20.7 Billion (Table 2). This is up from US2.9 Billion in 1997, the decade has seen a steady increase year on year (Fig.5).

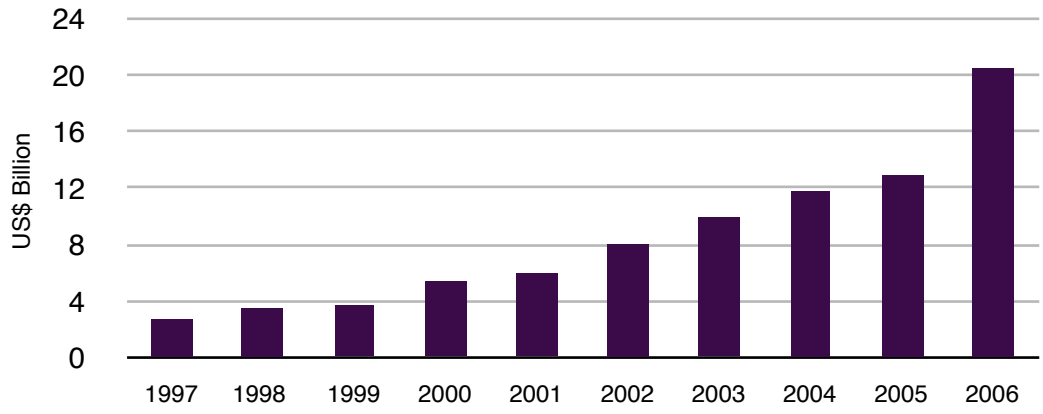

Figure 5: Green Food production value (1997 - 2006). (Data sources: Lianfu,1999; IOSC, 1996; Youfu, 2002; EPRC, 2004; Lu, 2005; Chaney, 2007; Aiguo, 2005; 2002 est.)

Green food growth from 1997 to 2007 has been substantial (Fig.6). Green products have grown from 892 in 1997 to 14,229 in 2007. Green food enterprises grew from 544 to 5315. Output in million tons grew from 6.3 to 72 million tons. Green food hectares expanded from 2.14 million hectares to 10 million hectares. Production value grew from US$2.9 Billion to US$20.7 Billion; and export value US $70 Million to approximately US$2 Billion (in 2006) (Fig.6).

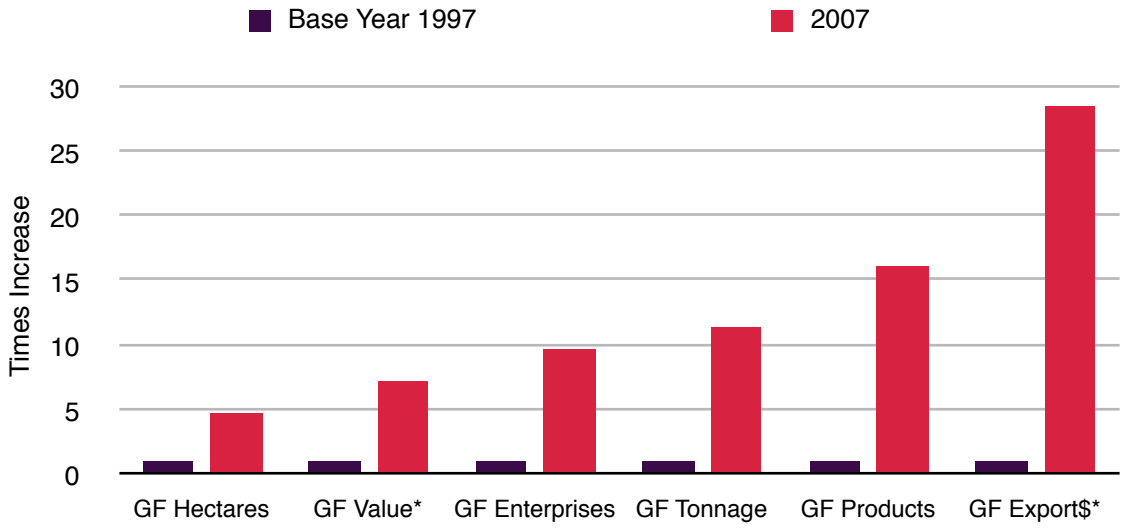

Figure 6: Green Food relative increases over a decade 1997 - 2007 (base year 1997 = 1). (Data sources: Youfu, 2002; Lijuan 2003; CRI, 2007; SCIO, 2007), (* 2006 figures).

Green food production standards and certification spans the spectrum of agricultural produce, with “cereals and oils” the largest category (Fig.7).

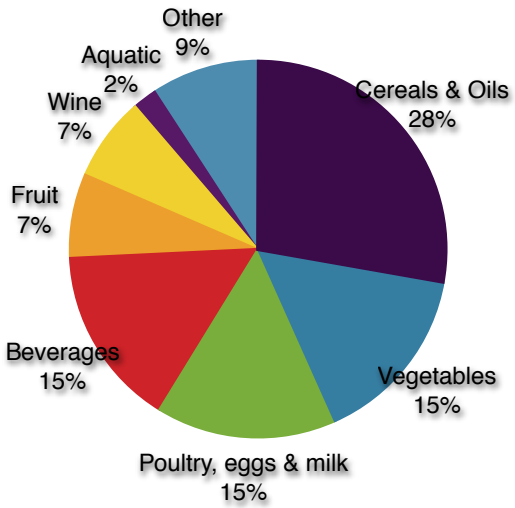

Figure 7: Green Foods by food sector (Source: Lijuan 2003).

There have been two grades of Green food since 1995, as a move towards meeting international standards for organic certification. “For the production of Green Food A, the use of pesticides, fertilizers, and other agricultural chemicals is extremely restricted. For Green Food AA, all chemicals are prohibited to be used in the production process. Therefore, Chinese Green Food AA is equivalent to organic food” (Lu, 2005, p.17). Green food has thus provided a path for farmers to move from chemical farming to a certified reduced chemical input regime to Chinese local standards, and from there to internationally recognised Organic standards. Providing such a transition pathway in an important Chinese agricultural innovation, and it may prove to be a useful model for other countries to examine and adopt when setting their own goals and strategies for expanding their Organic sectors.

Exporting the Green Food Standard

The Canadian Wheat Board (CWB) has announced that The CGFDC has accredited the production of 600,000 tonnes per annum of Canadian grown barley to carry the Green Food label (Lyons, 2008a). Citing commercial sensitivity the CWB declined to provide further data to the present author. However barley yield for Canada is reportedly 2.9 tonnes per hectare (Burnett, 2008) so this suggests that the area in Canada certified for Green Food production is at least 200,000 hectares. This would be 5.6% of Canada's barley planting which totals 3.6 million hectares (Burnett, 2008). Lyons (2008b, p.3) reports that currently "all barley exports from Western Canada are marketed through the CWB".

The CWB reported that it "is honoured to receive this respected and sought-after designation on its malting barley exports". It commented on the certification process:

> "The accreditation process was very rigorous, with the CWB submitting several hundred pages of technical data and information on management practices, air quality and soil analyses, Canadian food-safety and quality-control systems, malting barley selection, marketing and shipment. The application and approval process also included an inspection visit to Western Canada by the China Green Food office" (Lyons, 2008a, p.3).

According to Giovannucci (2006, p.10) companies in "Australia and France are among the first to be recently Green Food certified to export barley and whey to China".

China's Green Food certification of off-shore production is an interesting development of China imposing its own production standards and eco-labelling requirements beyond its own shores. There is no indication that the CWB will achieve a premium price. The indications are that Green Food certification is viewed by the CWB as achieving "a marketing edge (Fitzhenry, 2007) and as a trophy: "It is a significant achievement to have so much of our malting barley recognised with the prestigious Green Food label" (Lyons, 2008, p.3). This demonstrates that China now has the purchasing power to impose its own eco-standards, and producers have the motivation to meet and seek Chinese eco-certification.

Food Challenges

Noon (2007) has dubbed it "The MADE IN CHINA problem". She refers to issues that have played out in the international press, "melamine in wheat gluten … toothpaste problems, and cough medicine". She lists "High pesticide residues" and "Heavy metal pollution in soils and water" as ongoing concerns. Chaney (2007) comments that "A string of scares in the last three years - from cancer-causing Sudan IV in egg yolk to poisonous malachite green in freshwater fish - has given rise to a new breed of food company". According to Noon (2007) it is up to "the businesses involved in the China trade to restore trust in Chinese products. We must convey to consumers driving the market that new standards are being set and we must be actively involved in creating and maintaining the new standards. Some may abandon China - we heard just last week that Trader Joes will no longer sell retail vegetables with the MADE IN CHINA country of origin statement … we think this was a knee-jerk reaction". Noon reminded her audience that "One cannot help but remember what MADE IN JAPAN meant 50 years ago. Rest assured it will be no different in China - except it will happen with much greater speed". Noon nominates the "quick execution of Zheng Xiaoyu who was head of the SFDA (Safe Food and Drug Administration)" as an example of "just how determined Beijing is to make this go away".

Lu (2005, p.9-12) identifies 27 restrictions imposed between 1997 and 2004 on China food exports, mostly for pesticide or antibiotic residues. They include Japanese restrictions: frozen chicken and shrimp due to the levels of antibiotic residues; and frozen spinach due to pesticide residues. He identifies European Union restrictions: due to alfatoxin levels in peanuts; on tea due to pesticide residues; on chicken and shell fish due to antibiotic residues. A "US$1.1 billion trade loss" is reported due to Chinese honey with "levels of antibiotic, acarid and acheomycin residues" (p.11). Lu reports that the US has imposed restrictions on Chinese honey and shrimp due to antibiotics. Lu points out that residue standards can vary widely across jurisdictions, citing standards for the antibiotic chloramphenicol as: 0.1 - 0.3 µg/kg for the EU; 4 - 5 µg/kg for the US; and the, Japanese standard of 50 µg/kg (p.13). It would be naive to think that this pain in the market place for Chinese food exporters

has not been one of the drivers of Green food and eco-agriculture in China. Lu comments that: “While these measures may have restricted Chinese market access they have also served to improve the quality of Chinese food exports and enhance its export potential” (p.12).

In a study by the present author (Paull, 2006b) respondents devalued food from China by 21% compared to food from Australia. That study used an online survey instrument which incorporated an optional comments box at the end. Of 221 respondents, 81 used the optional comments box, and of these, 12 respondents wrote comments referring specifically to food from China, all of them were negative (Table 5). The research instrument was not designed to elicit written responses, so any use, or not, of the optional comments box for any purpose, was entirely at the discretion of the survey respondent. So, regarding food from China, these comments should be read as spontaneous comments, incidental to the purposes of the said study, and are not presented as a representative sample of anything. However, they are consistent with the fact that Chinese food was significantly devalued by respondents, and what they do suggest is that at least some Australian consumers appear to harbour a strong resistance to food from China. They may indicate what are some of the underlying consumer issues to be addressed in marketing food from China, and they may provide some clues as to how such resistances may be overcome.

Respondent Comments on Food from China
• *Suspicious re China claims unless certified organic.*
• *Generally I am dubious of any claims of "organic" or "natural" when it concerns a product from China.*
• *I think if it is labelled 'certified organic' in Australia there is a fair chance that it IS. Any labels used in China, I feel, can not be relied upon.*
• *Not really happy buying from China even if it is cheaper.*
• *Wanted to make all Chinese ones lower than $5 as that figure is higher to me than they are worth. I suppose though, to discourage purchase one should really make them VERY expensive!*
• *I wouldn’t buy anything produced in China whether it was organically certified or not because I don't believe their certification regulations would be as strict as Australia's. Besides I prefer to support my local market … and not a foreign country.*
• *I do not like or trust products that come from China.*
• *Labelling on Chinese products are not trustworthy with reports on counterfeit labelling.*
• *TRUST Australian Grown, DISTRUST organic/eco as marketing terminology instead of real information, Distrust China growing and manufacturing conditions - also don't know certifying body so no trust.*
• *I also know how foodstuffs grown in China are "fertilised" (human excrement).*
• *I would never buy Chinese food, as I don't trust their labelling, what-ever it may say. Or whatever it cost. I wouldn't eat it if it was given to me.*
• *I would not buy any food with 'made in China' on the label.*

Table 5: Consumer views of food from China.

It is not just western consumers that express concern with food produce of China. Zhang (2005, p.57) reports that “Chinese consumers are very much concerned about food safety”. The challenge to public perceptions of Chinese certified organic produce is summed up:

> “China faces many uphill battles and as a country comes under particular scrutiny for various reasons. The rapid growth and quick conversion of many hectares from conventional to organic as well as the legacy of past agricultural practices and questions of possible toxic residues in the soil increase concerns. Polluted water supplies and other environmental issues cannot help but raise questions in the minds of buyers today. This presents a real problem due to the booming demand for organic food worldwide. Buyers are searching for organic teas, soy, bamboo shoots, peapods … and such products in quantity are not easy to find” (AFB, 2007).

Exporting eco-produce, especially Green or Organic has the double benefits to China of gaining market acceptance and gaining price premiums. These benefits can flow back to farmers as health, environment and economic benefits. Most Chinese agricultural exports are now eco-produce: “Hazard-fee, green and organic products make up 90% of all agricultural-product exports” SCIO, 2007,2(1)).

GM in China: Backlash and Ambivalence

In 1992 China was the first country to commercially grow a GM crop (Pray & Huang, 2007). This was a non-food crop, tobacco, and it was abandoned in the “mid-1990s” due to resistance because “American tobacco companies using Chinese tobacco for Japanese markets expressed concern about possible negative reactions of Japanese consumers to cigarettes containing transgenic tobacco” (p. 162). This is perhaps a rather odd undercurrent of health and environmental consciousness amongst Japanese cigarette smokers?

Consumers have a low awareness of GM food (Zhang, 2005). Pray and Huang (2007, p.162) report that “In 1997 the first Chinese Biosafety Committee was established”. At that time they approved GM cotton and GM crops that “were already in the field” which were “tomatoes, sweet peppers, chilli peppers and petunias” (p.162).

In the decade since the establishment of biosafety oversight for GM crops only two new GM crops, one of them a food crop, have been approved for commercial production “virus-resistant papaya and insect-resistant poplar tree varieties” (Pray & Huang, 2007, p.162).

Other than the documented health and environmental concerns regarding GM crops (e.g. Smith, 2007), there are other issues. China has already experienced the buyer and consumer backlash from its initial and short-lived foray into GM tobacco in the early 1990s, and China has already experienced resistance to its food exports without introducing the opportunity for the exacerbation by adding GM. There is also the important political issues of food sovereignty and security, that “seeds are too important to Chinese food security to be dominated by foreign companies” (Pray & Huang, 2007, p. 163).

While resisting the introduction of new GM crops, China has been more open to the import of GM crops, and these imports include GM maize, soy, and canola. At the retail level, the cooking oils derived from the GM imports are labelled as GM (Pray & Huang, 2007).

Labelling requirements for GM food and other agricultural products have been in place since May 2001 (CSC, 2001) - the *Regulations on Administration of Agricultural Genetically Modified Organisms Safety.* They instated a labelling system (Article 5). A “marketing license” was required to market GM produce (Article 26), produce was required to be “clearly labelled when they are sold in the territory of the People’s Republic of China” and “Unlabelled products shall not be sold” (Article 28), and constraints requiring pre-approval on advertising GMOs were instituted (Article 30). Imported GM products require labelling to enter China: “Where agricultural genetically modified organisms to be imported are not labelled as required, the goods cannot enter the territory of China until being re-labelled” (Article 38). For the import of GM produce into China there are requirements that “the exporting country … has permitted the usage for the same purpose” and that “the exporting country … has, through scientific experiment, proved that they are harmless to human beings, animals and plants, microorganisms and ecological environment: (Article 33).

Comments, Conclusions and Green Futures

China’s embrace of green production including organics is important for the world because to some extent, where goes China, there goes the world. China’s economy, food and standards are increasingly a global phenomenon.

China is viewed as a cheap source of ingredients by some western food manufacturers (Hipp, 2007; LeCompte, 2007) and the future of China’s organic industry has been painted as a supplier of organic ingredients (Kuhlmann, 2007). Under such a scenario China’s organic production is exported and the

“memory of it’s “organicness” is retained while the memory of its “Chineseness” is lost. This is achieved by invoking local food regulations in importing countries (for example Australia and New Zealand) where the resultant processed food can be labelled “Made in Australia” for example, labelled “Certified Organic” and “Made from imported and local ingredients”. This selective loss of production information (provenance is suppressed, organic-status is retained) risks some future “Organic-gate”, where consumers realize they have been duped, or if not duped at best selectively informed. A blowback on this issue would be damaging for the international organic enterprise. As China ramps up its organic production to be a major organic global supplier, and that largely for export, this potential for a consumer blowback increasing overhangs the international organic trade. This is, for the moment, a “sleeper” issue, however the only question is which will awake first, western organic consumers or western organic manufacturers and certifiers. The issue of provenance suppression and de facto consumer deception may be simply resolved by the organic industry adopting a truth-in-labelling approach and including provenance data on all labelling. Since the certification of organic produce requires traceability to source, this is well within the capabilities of the industry.

The longer term future of Chinese organics may be as branded products, rather than as generic produce, as international confidence in Chinese food production improves, and as Chinese manufacturers aim to capture the added-value that processing, provenancing, production narrative, and smaller supply-unit sales, can offer.

China’s Green Food project has been described as “one of the most important success stories in Asian agriculture” (Giovannucci, 2005, p.xi). It has clearly been successful in recruiting Chinese farmers and consumers, as well as overseas buyers and most recently Canadian farmers. In the export market it seems that Chinese Green Food certification is used by overseas processors as quality assurance strategy. There is no evidence that such processors are marketing their product ingredients as Green Food, to do so would identify the ingredients as Chinese, so there is a perceived and probably real economic advantage in them suppressing both the “green-ness” along with the “Chineseness”

Green Food in China was born of a complex milieu of factors, including, environmental pollution problems, pesticide contaminations, the need to maintain a healthy population, the need to produce safe and nutritious food for the world’s most populous country, the need to raise farmers income, to reverse the excesses of the so called green Revolution, to keep farmers on the land and stymie the drift of the rural workers to the cities, and the bad press and image of China-produced food in the international market, and so called “green barriers”.

The reasons for Green Food are multifactorial, as are the benefits. Green Food goes some of the way to resolving many problems and challenges for China. And the benefits that accrue to China accrue to the world. As China’s Ministry of Agriculture points out: “The food security in China will have an important bearing on world food security” (MOA, 2004, p.31). And food security underpins every other form of safety, security and world well-being.

Where others have failed (Giovannucci, 2005) China has successfully created and implemented on a massive scale and over nearly two decades, a certified food scheme that is a half way house between what Northbourne characterized as chemical farming and organic farming (Paull, 2006c). This has already lead for millions of hectares to upgrading this reduced-chemical farming to organic farming. And with all the issues driving the push to both green and organic food, this pathway from green to organic in China can be expected to continue. China is already a world leader in organic production (Paull, 2007) and is second only to Australia in total certified organic hectares.

To some extent the world's shift to high chemical-input farming has been driven by high labor costs and cheap land and cheap chemicals. As the production and transport costs of chemical pesticides and fertilizers continues to rise, organic farming becomes more cost competitive. Couple this with the increasing awareness of pesticide residues in food, water and the environment, China appears to be on a winner with a grand-scale project for conversion from chemical to green to organic production.

The greening of China’s food is one element of a bigger vision, and concern of the Chinese leadership. “It is basic national policy in China to plant trees, protect forests and improve the

ecosystem. The Chinese Government has been attaching more importance to ecological development since the beginning of the new century" while acknowledging that "China ... has not fundamentally reversed the trend of deteriorating ecosystem" (Jiafu, 2002). State Forestry is implementing a 50 year program to increase forest coverage in China, from 16% to 26% of land cover, and to "rebuild a beautiful landscape", while "implementing the principle of giving the priority to ecological benefit" (Jiafu, 2002).

Year on year since 1992 and the founding of CGFDC there has been a steady increase on all measures of Green food production, and this is expected to continue for the foreseeable future, and at the expense of non-certified production. The production mobility of the past nearly two decades has witnessed non-certified food production steadily migrate to Hazard-free and Green food, and from Green food to Organic food, and government policy and economic opportunity suggest this mobility will continue, with the non-certified sector continuing to shrink as a proportion of the whole.

There is no evidence that China has ever, across thousands of years, aimed at the bottom. China has a fine tradition of excellence, of stewardship of its land, and of a communion with nature. Although the so called Green Revolution set some of that historical and philosophical positioning awry, China's agriculture and production is now on a quest to be the best and Green Food is playing a role in this transition. It is easy for new world sniping at China's current "growing pains" and product scandals but if new world producers such as Australia, USA, and Brazil continue on their seemingly blind adherence to chemical & GM farming, with their feet firmly in a productionist model rather than a consumerist model, the question is, will their agricultural products be the new cheap trash of the world?

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