

# Development, Current Issues and Prospects of Organic Agriculture Movement in Korea\*

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## I. Introduction

Over the last two decades, agricultural production in Korea has largely increased through technological advances. While the adoption of new technologies such as extensive use of agricultural chemicals has kept food costs relatively low, there are environmental and human health costs associated with the heavy dependence on chemicals. Concerns such as food safety and environmental degradation caused by agricultural run-offs such as fertilizers, pesticides and animal wastes are receiving more attention.

In the late 70's and early 80's, several new movements of organic agriculture had been started by some pioneers realized the negative aspect of overusing chemical fertilizer and agrochemicals. But in the early 90's, it became very popular idea in the country because people thought organic agriculture could be one of the necessary tools not only to protect the soil and water environment from modern agricultural

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practices but also to protect korean agriculture from imported agricultural products which might be contaminated by chemical during cultivation and transportation.

In the early 90's, consumer pay a greater attention to quality of agricultural product compare to those in the 80's. And recently the korean government developed an agri-environmental policy to support the organic agriculture and introduced certification programme for organic products.

It is believed that organic farming is the best farming practice from an environmental standpoint if the norms of organic agriculture(EEC, 1991 ; FAO/WHO, 1996 ; IFOAM Basic Standard, 1994 ; Organic Crop Improvement Association, 1996 ; The Soil Association, 1996) are fulfilled.

Since the organic agriculture will progress to be one of the very important alternative production systems in the future, this paper will review shortly the development, situation and future perspectives of organic agriculture in Korea.

## II . Development of korean organic agriculture

### 1. Beginning of korean organic farming and consumer organization

Organic agriculture in Korea began in the early 70's by some pioneers in rural area, but the first organic farmers organization, Chung-Nong-Hae(Right Farming), was established in 1976. Korea Organic Farming Association(KOFA) and Korea Natural Farming Association(KNFA) were found in 1978 and 1986 respectively. KOFA and KNFA are the pioneer organizations in farmers' training and consumer advocacy in organic farming, which mainly works to develop and extend organic agriculture farming techniques and promote organic agriculture to consumers. KOFA which has 17,998 farms as full membership in 114 branches is the biggest organization. KNFA which has 6500 farms is the second largest. In the beginning korean organic agriculture was actually initiated by 3 pioneers of organic agriculture, Mr. J.H.Kim(President of Chung-Nong-Hae), Mr. J.Y.Jung(Vice-president of KOFA) and Mr. H.K.Jo(President of KNFA) respectively.

In 1983 the first consumer organization for organic agricultural product, Consumer Cooperative, was organized. In 1986 Hansallim was established by Mr. J.I.Park, trying the direct transactions between organic farmers and consumer with the help of Catholic Farmer Council. Hansalim has more than 12,000 household members, deliver once a week and supply more than 320 items per year. Consumer Cooperatives has developed in more than 80 Consumer Cooperatives around country. Credit Union

carries the environment movement and directs transactions of organic agricultural products as one of the rural development projects.

From the early 90's, Korea Catholic Farmer Council and Korea Christian Farmer Council had tuned their activity in focussing on the life community movement and the regional network activity for organic agriculture. Both organization have been tried to strengthen the solidarity of environment movement organizations and organic agriculture organizations and organize an organic agriculture course for organic farmers or consumers.

In 1992 the Korean Society of Organic Agriculture(KSOA) was established by peoples of organic farmer's organization, consumer organization and government and scientists from universities and research institutes. KSOA is publishing the Journal of Korean Society of Organic Agriculture twice a year and organizes a symposium in spring and an annual scientific conference in autumn regularly. After establishment of KSOA, the organic agriculture in Korea becomes a new scientific issue for scientists at universities and research institutes in all possible disciplines of agriculture. As result KSOA implements the korean organic agriculture toward the scientific consideration and accelerative development.

In Korea the organic agriculture is still defined officially by MAFF(Ministry of Agriculture, Forestry and Fishery) as a farming system which does replace of chemical fertilizers by organic manure and compost and the avoidance of agricultural chemicals for crop production. This definition is quite different from IFOAM's Basic Standard and FAO/WHO Codex(draft guidelines for the production, processing, labelling and marketing of organically produced foods), since it does not contain any minimum requirement for rotation, legume and green manure for soil fertility, and resistant cultivars and closed recycle system. Therefore organic farmers and consumers in Korea understand that the system is operated in case the crop is cultivated by applying with organic fertilizer but without any agrochemical and chemical fertilizer by MAFF's definition, the organic products is the real one even if the system is not operated by internationally recognized IFOAM's Basic Standard or FAO/WHO Codex.

In practice, however, there are problems in following the definition of organic farming by MAFF and there has been little investigation of technological problems involved on the practising of organic farming or its effects on soil nutrients and their availability to crops(Hong, 1995 ; Sohn, 1995 ; Sohn and Yoneyama, 1996).

## 2. Development of korean organic agriculture

There are 14 organizations of organic farmers and consumer cooperatives in the country. They are trying to share skills and experiences, and to sell/purchase the organic agricultural products in the market together. All of the 14 organic farmers organizations and consumer cooperatives were incorporated into the Producer and Consumer Organization's Association for Environmental Agriculture(PCOAEA) in October 1994 as an umbrella organization of sustainable agriculture movement. The aim of PCOAEA is to strengthen the cooperation between organic farmer associations and consumer organizations and to contribute the promotion of environmental agriculture through magnification of sure footholds for safe organic products and organic product consumption.

Table 1. Organizations which get organic farmer's and consumer's activities in Korea(stand on April 30th 1996)

Organization	Establish at	Members	Activity & character
PCOAEA : Producer and Consumer Organization's Association for Environmental Agriculture	Nov.8.1994	12	Umbrella organization
KOFA: Korea Organic Farming Association	July 27.1978	17,063	Farmer's
KNFA: Korea Natural Farming Association	Aug.6.1967	3,500	Farmer's
Hansallim(Only One Life)	Dec.4.1986	17,400	Production & Marketing
Women Link	Sept.12.1987	2,080	Direct transaction, Women movement
Our Rural Community Rehabilitation Movement	June.29.1994	15,770	Direct transaction
Chung-Nong-Hae(Right Farming)	Jan.23.1976	400	Farmer's
Institute of Soil Subsistence	June 1993	985	Production & Research
Korea Catholic Farmer Council	Oct.17.1966	2,500	Farmer movement
Kwang-Rok-Hae(Sunlight Green)	May.31.1987	950	Farmer's
Credit Union	May 1.1960	365	Direct transaction
Credit Union of Our Life Cooperative	Jan.1992	647	Consumer's
Consumer Cooperative	Oct.13.1983	100,000	Consumer's

The Joint Conference on "Food, Culture, Trade and the Environment" was organized by International Federation of Organic Agriculture Movements(IFOAM) Asia and Pesticide Action Network(PAN) Asia & Pacific was held at Seoul on July 19-22, 1995. It was focussed on citizens' partnerships for food security, sustainable agriculture and safe foods in the 21st century. The conference has resulted in wide and effective exchange of experience and skill of various groups involved in organic agriculture.

The 1st International Academic Seminar on the Natural Agriculture was held on October 1996 in Korea to explain scientifically their experience of natural farming executed and to build up network for durable agriculture and global environment jointly with asian. After the seminar which was organized by KNFA and actually Korea have the initiative on natural farming in the region. Recently KNFA opened Research Institute of Natural Farming in order to develop the new technics for natural farming based in modern science and technology.

KOFA publishes the biweekly newsletters, "The Health and Organic Farming", and KNFA issues the monthly magazines, "Natural Agriculture", for farmers' training and consumer advocacy in organic farming.

In 1994 Ministry of Agriculture, Forestry and Fishery(MAFF) planed the long-term policy for environmental agriculture after the rise of environment crisis and the starting of WTO system. It appeared in 2 different policies with a support program for small scale farms and support program for environmental agriculture.

#### 1) support program for small scale farm

The reasons why small farms should be supported are as follows ; First, small farmers should join the organic farming or natural farming in order to produce high quality of agricultural products compared to conventional and get a high price in the market. Second, to protect water, MAFF is planning to develop several huge organic farming complex in watershed area. Third, MAFF wants to stimulate farmers to deliver a quality products by organic farming in the market in order to compare differentiation with the good quality from imported one. Besides MAFF is going to support the 1,000 small scale organic farmer's groups for 10 years(1995-2004) with 250 billion won(300 million US\$).

#### 2) support program for environmental agriculture.

As their activities of organic agriculture by KOFA and natural agriculture by

KNFA came to be appreciated by the government in the rapid change in international agriculture, KOFA and KNFA were registered as a corporation under the control of the MAFF.

As one of the several support programs to stimulate the Korean environmental agriculture, MAFF introduced a certification system by government for organic products<Table 2>. Fresh vegetables such as Chinese cabbage, radish, lettuce, crown daisy, kale are able to get organic label provided by government if they are produced organically by guaranteed organic farmer and farming site. Government expanded it to the organic fruit in 1997. Certification divided into three categories; organic product, non-agrochemical product and low-agrochemical product. MAFF is going to support the 189 environmental farming complex around country for 7 years(1998-2004) with 378 billion won(430 million US\$).

Besides, National Agricultural Cooperative Federation and Great Seoul City launched the organic farming project(100 billion won) in Paldang watershed area to protect soil and water from agricultural activity and deliver the citizens a good quality of agricultural product.

Table 2. Certification system for organic products by Korean government (stand on Feb. 1st 1997)

<i>Certification system for organic product : 3 categories of guaranteed organic farmer and farming site by government</i>	Numbers of farmer and farming site
Organic product	176
Non-agrochemical product	249
Low-agrochemical product	420
Total	845

\* Source : MAF (1997).

### III. Scientific activities in organic agriculture

In earlier days, the use of organic manures offered the only possibility for increasing soil fertility and the availability of composted cereal straw or vegetation collected from hillsides was limited. Much straw was used for purposes other than compost-making and the collection of hillside grasses, etc. was laborious. Consequently, there was a "compost hunger" and, because it seemed so valuable, farmers adopted the philosophy : "the more, the better", an attitude which persists today.

Until several years ago organic farming oriented farmers applied very large dressings of organic manure ; the average was 50Mt/ha per annum and even 150Mt/ha was not at all uncommon(Hong, 1995). Such generosity could have serious consequences.

## 1. Nitrate accumulation in organic vegetables

In early 90's Sohn's research team of Dan Kook University(Sohn and Oh, 1993) revealed some leaf vegetables could contain a lot of nitrate in edible parts. The nitrate contents in chinese cabbage and radish were low if they were cultivated with recommendation rate of nitrogen fertilizer, but it increased very much in case of over recommendation. It was known to introduce nitrate limit value of vegetables in order to meet the acceptable daily intake(ADI), 219mg/60kg b.w., of FAO/WHO(1995), because korean intake 2-3 times more nitrate than ADI(Sohn, 1995 ; Sohn, 1997). Some groups of organic agriculture even tried to utilize this data to propagandize the disadvantage of conventional farming.

But in early 90's another big surprise from nitrate investigations was showed that organic vegetables produced in non guaranteed organic farm lower nitrate content than those in conventional farm, but certificated organic product by government the highest value among the three categories. Even organic pioneers still prided on themselves that they were able to apply a huge amount of organic fertilizer to vegetables. So they used to show visitors confidently how their organic soil profile look alike. Organic farmers apply 50t/ha per annum and even 150t/ha is not at all uncommon. Such generosity can have serious consequences(Hong, 1995). They did not notice that if they apply to much organic fertilizer could contaminate the groundwater and the rooted soil layer by nitrate and phosphate and cause nitrate accumulation in some leaf vegetables(Sohn, 1995).

After public get attention the high concentration of nitrate in organic vegetables, former doctrine of korean organic agriculture which is "the more they apply, the better the quality of organic product and the system operate", was slowly changed. The textbook of korean organic agriculture published by KOFA had to be changed the recommendation rate of organic compost and manure, first at 80t/ha, then at 50t/ha, and in June 1996 at 20t/ha.

Before MAFF introduced the certification system for organic products in the country, they should have tested the main technics of organic agriculture in view of soil science and plant nutrition, and should have checked the environmental influence. Policymakers understood that organic agriculture is environmental sound from foreign

literature and informations, so they just tried to introduce it in their country without any further examination in advance. What is difference between main technics of Korean organic agriculture and internationally recognized organic agriculture? And if there are some differences, what does it mean in terms of the soil and water pollution and quality of agricultural product? If they did this kind of investigation before establishment of new agricultural policy for environmental agriculture and certification system in the country, there should not have been no discussion for basic standard of organic agriculture, and, of course, no nitrate problem in organic leaf vegetables at all.

## **2. Research on compost and microorganism**

Institute of Soil Subsistence, a private research institute, in direction of organic agriculture and environmental agriculture, opened at Chung Buk province in 1989. The activity of the institute focuses on the agricultural application of microorganisms and composting of food waste.

Recently there is a higher accumulation of phosphate and salt in the organic farm compared to glasshouse farm as reported by Environmental Agriculture Lab of DKU. They found that 200-300ppm  $\text{NO}_3^-$  and 1500-3000ppm  $\text{P}_2\text{O}_5$  in the 0-30cm, 30-60cm soil depth of organic farm is due to overuse of organic fertilizer.

DKU and National Agricultural Science and Technology Institute launched research projects to investigate the technological problems involved on the practising of organic farming, and they also study its effects on soil nutrients and their availability to crops.

Prof. Dr. J.H.Joo(Dong Guk Univ.,) is concentrating to find out the effect of microorganisms in decreasing the nitrate content in soil and vegetables. And for composting Prof. Dr. K.Y.Jang(Chung Nam Univ.,), Prof. S.Y.Lee(Cheon Buk Univ.,), Prof. Dr. H.S.Park(Cheon Nam Univ.,), and for vermicompost Prof. Dr. J.S.Lee(Yonsei Univ.,) does some research projects and follows the organic agriculture with very strong engagement.

## **3. Introduction of IFOAM's basic standard into korean organic agriculture**

Since there is still no basic standard for korean organic agriculture, the discussion on it will continue in the future. During the discussion, organic farmers and consumers are obviously in confusion what is the real organic. Therefore it is urgent to introduce the basic standard in Korea.



Most organic farmers in Korea still do not realize that the importance of rotation, legumes, green manure, closed recycling system, resistant variety and appropriate application of organic fertilizer in organic agriculture. They just believe if they apply organic fertilizer to cultivate crops, the system operates and they will produce safe food. But there are some organic farmer groups, e.g. Chung-Nong-Hae and KNFA, which are applying less organic fertilizer than KOFA, and they are also trying to keep basic standard of IFOAM(1994) such as rotation, legumes and green manure.

In 1995 Environmental Agriculture Lab of DKU pointed out that korean organic agriculture is practiced in a completely different way from internationally recognized one and that introducing of IFOAM's Basic Standard to korean organic agriculture is an essential for performance of organic agriculture and production of safe food. Since korean organic agriculture was developed by pioneers' experience, the core techniques of organic agriculture never get any opportunity to be investigated scientifically. Maybe that would be a reason why the main techniques of korean organic agriculture developed differently. Another reason for that might be there was no one scientist who researched on organic agriculture in Korea until early 90's. No universities, institutes or administrations did pay really an any attention to investigation on environmental impact and safe food production by the core techniques of korean organic agriculture in terms of natural science.

#### **4. Extension activity by consumer organization, university and agricultural cooperative**

Korean consumers get a lot of attention on organic agricultural products year to year, but people are still very suspicious whether organic labeled articles were cultivated organically and is a safe food, free from pesticide, nitrate, heavy metal and so on. After an affair of high nitrate content in leaf vegetables, Citizen's Alliance for Consumer Protection of Korea(CACPK) began new movement in agriculture, called, "environmental friendly consumption" in cooperation with Environmental Agriculture Lab of DKU. Not only they regularly sample organic vegetables from market but also visit organic farms and investigate nitrate contents of vegetables in order to give ideas for right handling organic fertilizers and the basic standard of IFOAM's. Especially Prof. Dr. B.K.Song and Ms. J.O.Kim of CACPK, and Prof. Dr. S.M.Sohn of DKU believe that regular nitrate monitoring in vegetables would contribute to the avoidance of nitrate accumulation in vegetables and decrease water pollution, caused by overuse of organic fertilizer. Doing this kind of campaign, it is hoped to help organic farmer in Korea to orient themselves to stand firmly(or to approach) the

exact truth of organic agriculture, and finally korean organic agriculture is being recognized as a part of environmental agriculture by scientific approval.

## **5. Education and research of organic agriculture in universities and research institute**

First time in Korea, since winter semester of 1993, Dept of Horticulture in Seoul National University is offering *Organic Horticulture* in bachelor course by initiation of Prof.Dr.B.I.Lee.

Since 1995, in the bachelor course of DKU it has been offered 3 lectures, e.g. *Environmental Agriculture, Introduction to Organic Agriculture, International Organic Agriculture*. Besides DKU offers also the 2 years master course for environmental agriculture. The Environmental Agricultural Lab of DKU focuses the research topics such as nitrogen dynamics in soil, nitrate leaching, nutrients accumulation in rhizosphere, nitrate accumulation in edible parts of vegetables, nitrate simulation model, expert system, and compost in terms of organic agriculture.

For direct marketing and farm management analyse Prof. Dr. H.Kim(Dan Kook Univ.), Prof. Dr. J.M.Kim(Seong Kun Kwan Univ.) and Prof. Dr. D.K.Yoo(Dong Guk Univ.) are the well known scientists in Korea.

Dr. J.H.Seo and Dr. J.S.Kim in Korea Rural Economic Institute has initiated some research cooperation on organic agriculture with Dr. S.K.Lee of Department of Plant Nutrition in National Agricultural Science and Technology Institute(NASTI), RDA/MAFF. The projects have been focused to analyse the farm management assessment and marketing system in organic agriculture. Since mid of 90's the Alternative Agriculture Laboratory(Dr. J.W.Hong, Dr. K.N.Hwang) was established in the Department of Plant Nutrition of NASTI to research into organic agriculture as a possible farming system for the future alternative agriculture.

In the future it is strongly requested to offer some lectures related to organic agriculture/environmental agriculture in all agricultural universities, because at the moment they give just unilateral education to students in terms of chemical agriculture. But we it should not be forgotten students have right to study both conventional and organic production systems if alternative agriculture is necessary for the future.

#### IV. Current issues and prospect

In March of 1991 the Committee for Organic Agriculture was instituted in MAFF, and since December of 1993 certification system for organic agricultural product was operated for the first time in the country by National Inspection Institute for Agricultural Product(NIIAP). But the committee made a big mistake to give the definition "organic agriculture", they defined it as "Organic agriculture should be operated by only applying with organic fertilizer, natural mineral, microorganism, not applying with any synthetic materials such as chemical fertilizers, organically synthesized agro-chemicals, animal feed additives". But this definition has been led to population a wrong orientation on organic agriculture and even to organic farmer. Furthermore, as results of this it has been given a lot of confusion, discussion, problems for organic agriculture and certification in Korea as mentioned above.

As one kind of sustainable agriculture in the future the Korean organic agriculture should be accelerated with government assistance. This requires the more refined long-term governmental plans.

But certification body, NIAPP, should introduce the basic standard for organic agriculture which is to coincide with IFOAM Basic Standard(1994) and FAO/WHO Codex guidelines for organically produced foods(1996) before the government plans some incentives for organic farmer such as subsidizing program, conversion payment, watershed program and so on. It is important to be convinced that the practice of organic agriculture is really contributing to the environment in terms of soil pollution (nitrate, phosphate, heavy metal and salt accumulation), water pollution(mineral element, pesticide) and air pollution(nitrous oxide, methane) because Korean organic farmer do not keep the basic concepts of organic agriculture. It has been still widely believed in some Asian countries that the system operates perfectly and produce a safe product if they apply only organic fertilizer for the crop cultivation. The most important and urgent task to do organic agriculture in an environmental sound way and to produce a safe food is the changing the official definition for organic agriculture by MAFF and introducing of the basic standard into the Korean organic agriculture by organic farmer's associations.

Equally it is important that the resistance variety are required to practice the real organic agriculture in the country, since Korean organic farmer have to sow certainly the conventional seeds which are available in seed market and are premised on the use of chemical fertilizers and pesticides. Korean organic farmer have no alternative choice to buy the organic seed with strong resistance against pest and disease.

The point of view that organically grown leaf and root vegetables contain

relatively high nitrate content compared to conventionally grown one, organic vegetables try to keep the lower nitrate value than those from conventional farming by introducing of the international recognized basic concept of organic agriculture such as IFOAM's and CODEX's.

Research, experiments, and extension services are also important to develop scientifically approved organic agriculture technologies and to distribute them to the farm level.

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## 韓國有機農業 運動의 發達과 當面課題 및 展望

손상목\* · 정길생\*\*

### 국 문 요 약

유기농산물은 질 좋은 농산물이며 그 생산농법이 환경친화적인 것으로 이해하고 있어 참여농가수도 증가일로에 있고 소비자들에 의한 유기농산물 구입 역시 점차 증가 추세에 있으나, 한국유기농업은 국제적 유기농업과 다르게 잘못 정의된 채 확산되고 있어, 그 핵심기술의 환경영향평가와 과학화에 대한 시대적 요청과 유기농업 기본규약 제정 필요성이 학계 일부에서 제기 되고 있는 등 한국유기농업은 최근 발전을 위한 진통을 겪고 있다.

이에 본 논문은 한국유기농업이 태동된 배경과 70년대 말로부터 80년대 초에 걸쳐 태생된 한국유기농업이 국민적 관심을 얻게된 배경과 정농회, 한국유기농업협회, 한국자연농업협회, 한살림 등의 유기농업단체와 한국유기농업학회, 환경보전형농업생산소비단체협의회, 흙살림연구소 등의 발전과정 및 활동을 소개하고 있다. 또한 서울에서 개최된 IFOAM Asia대회, 한국자연농업협회의 “자연농업연구소”, 한국유기농업협회의 “건강과 자연농업” 등에 관해서 뿐만 아니라 우리 정부의 21세기를 향한 농림환경정책중 유기농업부문에 대한 각종 장기지원책, 즉 중소농대책의 일환의 유기-자연농업 지원책, 유기농산물에 대한 품질인증제 및 팔당상수원보호구역내 유기농업지원 등이 소개되고 있다.

한편 한국유기농업기술의 핵심내용이었던 유기질비료 과다사용 문제가 “유기농산물 채소의 고 질산염 함량”으로 촉발된 식품안전성 논쟁 후에 유기질비료의 추천사용량이 다다익선적 개념에서 80t/ha으로 낮아졌다가 다시 50t/ha으로 낮아졌으며 1996년 6월부터는 20t/ha로 크게 낮추어 졌음을 보고하고 있다. 또한 일부 선도적 유기독농가의 경험적 기술이 토대가 되어 성립된 현 유기농업기술은 과학적 기술검증을 거쳐야 함과 퇴비사용만으로 실시하는 현 유기농업기술에 의해 야기되는 근권내 질산 및 인산염 집적을 회피하기 위해서는 윤작, 녹비작물 및 두과작물의 재배로 토양비옥도 향상을 통한 유기농업 기술 개발이 필요하며 IFOAM 기본규약과 FAO/WHO Codex의 핵심 내용을 수용하는 한국유기농업 기본규약 제정이 절실히 요구됨을 강조하고 있다.

마지막으로 한국유기농업 핵심기술에 대한 환경영향평가와 기본규약제정 필요성을 역설하고 한국유기농업의 과학화와 질 좋은 유기농산물 생산을 위해 노력하고 있는 소비자문제를 연구하는 시민의 모임 등 몇몇 단체들의 최근 활동이 언급되고 유기농업에 대한 농과대학내 연구와 강의 등이 소개되었다.

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