Assisting Small-scale Farmers in Organic Agriculture: The Role of Rural Development Administration

Young-Woong Byeon

Focused on innovative organic crop production technologies
I RDA & Research System
1906 (April): 勧業模範場 (established in Suwon)  
* National institute for experimentation, survey, and guidance for agriculture

1929 (Sept.): 農事試験場 (Agricultural experiment station)

1947 (Dec.): 農事改良院 (National institute for improving agriculture)

1949 (Jan.): 農業技術院 (Agricultural Research & Extension Services)

1957 (May): 農事院 (National Institute for Agriculture)

1962 (April): 農村振興廳 (Rural Development Administration)  
- Promoting rural areas and contributing to national development  
- R&D and dissemination of agricultural science and technology

1996 (Feb.): Founded the Korea National Agricultural College

2009 (Sept.): Established the Foundation of Agricultural Technology Commercialization & Transfer

2014 (July) ~ 2015 (April): Moved from Suwon to Jeonbuk Innovation City
Vision, Core Project and Objectives

**Vision**
Leading the National happiness by Innovative agricultural technology

**Objective**

1. Supporting seed industry development
2. Development of tech. for self-sufficiency rate of food
3. Supporting agricultural export
5. Creating new growth engines for Agriculture
6. Improvement for quality of rural life
7. Rapid dissemination of developed technologies

- Establishment of stable supply of foods
- Strengthen agricultural competitiveness
- Secure new growth engine
- Realize sustainable agriculture
6 Departments & one center
- Dept. Agricultural Environment
  - **Organic Agriculture Division**
    (15 researchers, 2 technicians)
**Organic Agriculture R&D system**

**Organic Agriculture Division**

**Organic Farming System**
- Nutrient cycling
- Farming system
- Soil & Nutrient management
- Organic policy

**Organic Crop Protection**
- Biological control
- Beneficial organism
- Natural products
- Physical/cultural control

**Environment & Ecology**
- Environment impact assessment
- Bio-diversity maintenance
- Building international governance

- $1,410,000: Basic research (15 researchers)
- $2,210,000: Joint research (with university, agro industry company, external research institute etc.)
Researches on **organic crop productivity** is main subjects

Developing **organic materials** for **disease & pest management** is active

Researches on **environment / biodiversity** is beginning

Research on **multi-functions of organic system, postharvest, safety, processing**, is starting, and will be important soon

Recently, researches on **organic fruit production** have done intensively to cope with **abolition of low-pesticide of three certification for environment friendly agricultural products** (low-pesticide, non-pesticide, and organic).

**Cooperative system** among **researchers, organic farming leaders, politicians and rural instructors** was established and operated to solve effectively farmers’ on-site needs
Research System in RDA

Research Road map

Political needs

On-site needs

<Top-down>

Research plan considering research direction in next year

Project planning committee

Central/local Research item coordination/political consultation

Stakeholders committee

Project planning (review on reflection of technical need for next year)

Redundancy review/Additional political need reflection

New projects
Strategies of Organic Agricultural Researches

Vision

- Establishment of Highest Level of Organic Farming Standards
  - Organic farming production: 0.6% ('08) → 1% ('10) → 3% ('15) → 5% ('20)

Objective

- Development of **minimum input & resource recycling** by organic farming techniques
  - Goals: Yield 90%, Cost 90% compare to conventional farming

Strategy

- **Emphasis on SESE**: Simple, Easy, Scientific, and Effective
- **Achievement of PEPS**: Productivity, Environments, Profitability, and Safety
II Soil and Nutrient Management

Green manure

Liquid fertilizer
Liquid fertilizers

- Development of specific liquid fertilizers
  - Supply for nitrogen, phosphorous, and potassium

Composts/ Organic materials

- Diversification of organic materials
- Commercialization of organic composts

Green manure crop

- New green manure selection
- Development of cropping system
  - * Crop nutrient and physical property in soil
1. Green manure as alternatives for chemical fertilizer

- Maintenance and improvement of organic matters in soil
- Supply of plant nutrients with high quality
- Prevention of soil erosion
- Suppression of crop pest occurrence, etc.
  (pesticide alternatives: pathogens, pests, weeds, nematodes)
- Increase biological activity of soil microorganisms and nitrogen fixation
- Help nutrient circulation from sub-soil to surface soils, prevent from nutrient loss, and conserve nutrients by crop rotation with green manure
Selection of ‘vetch #1’, a new variety of hairy vetch
- 100% replacement of nitrogenous fertilizer
  (Sowing: early of Oct., 6-9kg/1,000m²)
  (NICS, 2008)

Development of successive cultivation technology of Chinese milk vetch
- 70-100% replacement of nitrogenous fertilizer
  (Sowing: middle of Sep., 4-5kg/1,000m²)
*Once sowing → can be cultivated for 2-3 years
  (NICS, 2008)

Selection of new varieties of barley as alternatives for rye, green manure
- Seven varieties including ‘Youngyangbori’, etc.
- 30-50% replacement of nitrogenous fertilizer
  (NICS, 2009)
2. Liquid fertilizers for organic crop production

Organic materials for the production of liquid fertilizers:

- Dried Fish debris
- Oil cake
- Bone meal
- Rice bran
- Molasses
- Animal manure
- Microorganism
- Charcoal
Nitrogenous liquid fertilizers

- Rice bran
- Soybean meal

Phosphorous liquid fertilizers

- Bone meal
- Molasses
- Microbial agents (Yogurt)

Potassium liquid fertilizers

- Sesame stems
- Charcoal
- Charcoal-eluted solution
Farm-made liquid fertilizers

Classification of farm-made liquid fertilizers and materials used

<table>
<thead>
<tr>
<th>Classification</th>
<th>Materials used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fermented liquid fertilizer</td>
<td>rice bran, soybean meal, bone meal, apple, pear, plum, kiwi, persimmon, peach, mongolian dandelion, water celery, igmocho, japanese hop, purslane, persimmon peel, tomato, ginkgo nut peel, spring onion, onion, food by-product</td>
</tr>
<tr>
<td>Fermented plant juice</td>
<td>pear, akebia quinata fruit, paprika, kiwi, mugwort, water celery, ginseng, seaweed</td>
</tr>
<tr>
<td>Amino acid</td>
<td>fish, fish by-product (bone, gut), fish sauce by-product</td>
</tr>
<tr>
<td>Calcium</td>
<td>egg shell, clams hell, oyster shell, crab shell, shrimp shell, bone meal</td>
</tr>
<tr>
<td>Phosphoric acid</td>
<td>sesame stem, perilla stem, rice bran</td>
</tr>
<tr>
<td>Others</td>
<td>phyllite, guano</td>
</tr>
</tbody>
</table>

(An et al., 2012)
3. Composts for organic crop production

- Supply of nutrients with good quality to plants
- Improvement of soil physical properties by soil aggregation
- Increase of water- and nutrient-holding capability
- Increase of effective microbial population
- Suppression of soil-borne plant diseases such as Sclerotinia rot (菌核病) and bacterial wilt (青枯病)
Compost materials classified based on nutrient components

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>By-product</th>
<th>Livestock manure</th>
<th>Herbal/animal materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen</td>
<td>sawdust, rice husk, bark, rice straw</td>
<td>cow, pig, chick dung</td>
<td>rice bran, oil cake, fish meal, blood meal</td>
</tr>
<tr>
<td>Phosphorous</td>
<td>rice bran, meat bone meal, calcined bone meal, rock phosphate, guano</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potassium</td>
<td>compost, rock powder, illite, ashes, potassium chloride, potassium sulfate, potassium (manganese) sulfate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calcium</td>
<td>dolomite limestone, lime stone, shell powder, egg shell, oyster shell, crab shell</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Compost production

Compost flipping
Commercialized/home-made organic composts

- Agricultural by-product: Oil cake, wheat bran, fishmeal, bone meal, blood meal, carbonized rice husk, etc.
- For sale, organic-certification of the composts is required
Plant Disease and Insect Pest Management
Plant Disease Management in Organic farming in Korea
I. Eco-friendly plant disease management

**Cultural Practice**
- Resistant variety
- Grafting
- Crop rotation, cover crop

**Physical Methods**
- Solarization
- Water management (rain proof)
- Micro-environmental conditions

**Biological Methods**
- Microbial fungicides
- Eco-friendly microbial formulations

**Commercial Products**
- Oil and egg yolk mixture
- Sulfur and loess mixture
1. **Resistant cultivar**: Potato late blight / Pepper *Phytophthora* blight

Potato late blight (疫病)

Almost not infected

Resistant cultivar

Susceptible cultivar

Early season

Late season

Pepper *Phytophthora* blight (疫病)
2. **Mix-cultivation**: Potato/Resistant variety and soybean

Suppression of potato late blight by mix-culture of potato and other crops

![Graph showing incidence of late blight in mono-culture, R-Potato, and Soybean]

- **Incidence (%)**
- **Crops/variety mix-cultivated**
  - Mono culture
  - R-Potato
  - Soybean

![Resistant potato/susceptible potato]

![Soybean/susceptible potato]
3. **Grafting:** using resistant stocks

**Pepper Phytophthora blight**

- Grafting of pepper is used commonly in a greenhouse cultivation.
- Practical use of grafting-pepper in the field is >3%
- Phytophthora could be controlled over 95%, compare to non-grafting
4. **Crop rotation: paddy-upland crop rotation**

**Incidence of white rot of garlic (黑腐菌核病)**

<table>
<thead>
<tr>
<th>Investigated field</th>
<th>Disease incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>No.</td>
</tr>
<tr>
<td>Seo-myeon</td>
<td>96</td>
</tr>
<tr>
<td>Nam-myeon</td>
<td>51</td>
</tr>
<tr>
<td>Yidong-myeon</td>
<td>43</td>
</tr>
</tbody>
</table>

*White rot: sclerotia-forming soil-borne disease, distributed largely in soil surface (in soil depth of 5cm)*
5. Green manure (rye) and high ridge cultivation

Onset time of pepper blight was delayed by 38 days

Disease incidence was reduced by 43.9%

Suppression of pepper *Phytophthora blight* by cultivation and soil-incorporating rye and high ridge (30cm) cultivation (Kim et al., 2005. JBARES)

* Also, bacterial wilt of pepper can be controlled by planting and soil-incorporating green manure
6. Solarization: Control of soil borne diseases and nematodes

**Control of Chinese cabbage club root (根瘤病) by solarization**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Control value (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Open field trial</td>
</tr>
<tr>
<td>Solarization</td>
<td>0</td>
</tr>
<tr>
<td>Sola+fungicide</td>
<td>29</td>
</tr>
<tr>
<td>Fungicide</td>
<td>12</td>
</tr>
<tr>
<td>Non-treated</td>
<td>0</td>
</tr>
</tbody>
</table>

*Control value: [(a-b)/a]×100 <incidence in control plot (a) and in treatment plot (b)>

*CC club root is soil-borne and severely occurred

*Solarization under the plastic film house condition is commonly carried out from July to August (hot summer season) for a month.
7. Rain proof: avoiding rain splash (Control of anthracnose, 炭疽病)

**Effects of the rain-proof system**

- Control: >90%
- Yield: 125%
- Income: 150%
- Labor: 50%
- Cheaper than greenhouse
- Easy to work
- Similar to field conditions
  - Air circulation, light, etc

* Pepper anthracnose pathogens are generally disseminated by rain splash and wind

**Effects of blocking rain splash on control of pepper anthracnose pathogen**

- Field I (2008)
- Field II (2009)
8. Air-circulation fan: Changing micro-environmental conditions

Effects of air-circulation fan on yield and control of strawberry powdery mildew (白粉病菌)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Incidence (%)</th>
<th>C.V. (%)</th>
<th>Yield (kg)</th>
<th>Brix</th>
<th>Hard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air-CF+BP</td>
<td>6.1</td>
<td>80.1</td>
<td>417.0</td>
<td>10.8</td>
<td>3.1</td>
</tr>
<tr>
<td>Air-CF</td>
<td>12.0</td>
<td>61.0</td>
<td>ND</td>
<td>11.2</td>
<td>3.1</td>
</tr>
<tr>
<td>Biopesticide</td>
<td>30.7</td>
<td>-</td>
<td>318.0</td>
<td>10.4</td>
<td>2.7</td>
</tr>
</tbody>
</table>

Air-circulation fan can be used to control several vegetable diseases including cucumber powdery mildew, cucumber downy mildew, tomato grey mould and tomato leaf mould in several vegetables.
Isolation and selection of antifungal *Paenibacillus*, AC-1

- **Isolate**: *Paenibacillus polymyxa*
- **Isolation origin**: pepper root
- **Mode of action**: Antibiosis
- **Target**: Powdery mildew, *Phytophthora* blight

<table>
<thead>
<tr>
<th>Disease</th>
<th>Treated</th>
<th>Untreated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cucumber powdery mildew</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rose powdery mildew</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pepper <em>Phytophthora</em> blight</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2. Q-pect: Microbial fungicide developed by NAS

Isolation and selection of hyperparasite *Ampelomyces*, AQ94014

- **Isolate**: *A. quisqualis*
- **Isolation origin**: Powdery mildew pathogens *infected by hyperparasites*
- **Mode of action**: Hyperparasitism
- **Target**: Powdery mildew

Untreated check

Q-pect treatment
Isolation and selection of a PGPR Bacillus, **EXTN-1**

- **Isolate**: *Bacillus vallismortis*
- **Isolation origin**: Pepper root
- **Mode of action**
  - Induce Systemic resistance (ISR)
  - PGPR (Plant Growth Promotion Rhizo-bacteria)
  - Balancing nutrient uptake
  - Stress recovery

3. **EXTN-1**: Microbial product developed by NAS
4. Eco-friendly commercial products for controlling plant diseases

Cooking oil and egg yolk mixture: COY

1. Add egg-yolk into a small amount of water and macerate for 3-4 min.
2. Add cooking oil into the suspension and macerate again for 4-5 min.
3. Dilute and spray with enough amount to cover whole plants

* Oil has suppressive effect against plant diseases and insect pests.

<table>
<thead>
<tr>
<th>Amount of egg-yolk and cooking oil</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Materials</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Cooking oil</td>
</tr>
<tr>
<td>Egg-yolk</td>
</tr>
<tr>
<td>Crops</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>Pepper</td>
</tr>
<tr>
<td>Paprika</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Eggplant</td>
</tr>
<tr>
<td>Lettuce</td>
</tr>
<tr>
<td>Cabbage</td>
</tr>
<tr>
<td>Rose</td>
</tr>
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<td></td>
</tr>
</tbody>
</table>
Soluble sulfur is a liquid form of sulfur powder and is widely used for the control of various diseases in organic field in Korea.

Foliar application of the soluble sulfur significantly suppressed pepper powdery mildew at 88.9%.
Soluble Calcium: \textbf{Calcium supply by eggshell and vinegar}

\textbf{Preparation}

- Dry and grind egg shells into flour.
- Add the grinded egg shells in vinegar slowly.
- Keep the solution in 7 days at 20-25°C (mixing once a day)
- Soluble process is complete if there is no bubble
- Strain soluble calcium through a sieve.
- Diluted 200 ~ 500 times for application
- Spray it on the front and back side of leaves

\begin{itemize}
  \item ground egg shells
  \item vinegar
  \item Soluble calcium
\end{itemize}

* Calcium strengthens the plant tissues and roots and raise resistance to plant disease
Insect Pest Management in Organic farming in Korea
II. Eco-friendly Insect pest management

**Cultural Practice**
- Green manure cultivation
- Push-pull strategy

**Physical methods**
- Lure trap: taste, light, color, pheromone

**Biological methods**
- Plant extracts
- Microbial insecticides
- Natural enemy
1. Green manure cultivation

Influence of pigeon vetch cultivation on insect pest and natural enemy densities on pepper

<table>
<thead>
<tr>
<th>Cultivation of pigeon vetch in pepper field</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pigeon vetch</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Green manure</td>
<td>Insect pest and natural enemy densities</td>
<td>Pepper</td>
<td></td>
</tr>
</tbody>
</table>
Influence of pigeon vetch cultivation on insect pests occurrence in pepper

Differences of aphid density (mean±SE) in cover crop, *Vicia tatrasperma*, plot and control plot in 2009(a) and 2010(b) (Asterisks indicate statistically significant differences according to T-test at 95% level).

Changes of damaged pepper fruits ratio (mean±SE) by *oriental tobacco budworm, Helicoverpa assulta*. 
Influence of pigeon vetch cultivation on natural enemy occurrence in pepper

Populations (Mean±SE) of spiders (a), lady beetles (b), braconid wasps (c), and lace wings (d) in cover crop plot (*Vicia tatrasperma*) and control plot in 2009
(Asterisks indicate statistically significant differences according to T-test at 95% level)
2. Push pull strategy: attractant/repellent plants

Control of striped flea beetle by cultivation of repellent plant

- Selection of Basil and Lemon balm as repellent plants (border plants) to beetle and plantation in the margin of the field: reduction remarkably striped flea beetle density

- Striped flea beetle caused big damages in organic Chinese cabbage
3. Lure trap: attracting/repelling insect pests

- Mass calling and killing
- Mating disruption
- Insect pest forecasting
4. Plant extracts: natural insecticides

- **Common name:** Pyrethrum
  - **Active ingredient:** Pyrethroids
  - **Target insect:** Aphids, leaf miners, moths, et al.
  - **Mode of action:** Nerve palsy

- **Common name:** Neem
  - **Active ingredient:** Azadiractin
  - **Target insect:** Several insects, nematodes, mites
  - **Mode of action:** Anti-feeding, -molting, -oviposition

- **Common name:** Derris
  - **Active ingredient:** Rotenone
  - **Target insect:** Cockroaches, mites, cucurbit leaf beetle
  - **Mode of action:** Stomach poisoning

- **Common name:** Sophora flavescens
  - **Active ingredient:** Alkaloids (matrine)
  - **Target insect:** Several insects
  - **Mode of action:** Nerve palsy, anti-respiration

- Extract of pepper seed and ginkgo leaves also used in farmers field
4. Plant extracts: natural insecticides

Density changes of bean bugs, *Riptortus clavatus*, after ginger, garlic, pepper, pepper-seed, and spring onions extract were sprayed on bean leaves.

- Pepper, its seed, spring onion extracts disturbed the early influx of bean bug in soybean field.
5. Biological control: Three entomopathogenic agents

- **Scientific name**: *Beauveria bassiana*
  - **Mode of action**: insect-parasitic fungus
  - **Target**: butter flies, white flies, thrips
    - high control activity under high relative humidity

- **Scientific name**: *Bacillus thuringiensis*
  - **Mode of action**: produce toxin
  - **Target**: butter flies, flies, beetles

- **Scientific name**: *Steinernema capocapsae*
  - **Mode of action**: invading into insects
  - **Target**: butter flies, slowpokes
5. Biological control: Entomopathogenic agents

Control efficacy of *Bacillus thuringiensis* and *Steinemema carpocapsae* mixture against *beet armyworm, Spodoptera exigua*, of Chinese cabbage on plastic house.

The same letter over the bars in each treatment indicates that there is no significant difference among means (p<0.05).

* Bt: *B. thuringiensis* (2×10^5 cfu/ml), Sc: *S. carpocapsae* (2×10^2 nematodes/ml)
6. Natural enemies

Insect pests and their natural enemies

Insect pests

Aphids
Mites
Whiteflies
Thrips

Natural enemies

Aphidius sp.
Predatory mites
Encarsia sp.
Orius sp.
Organic on-farm Researches
1. Organic cultivation of Chinese cabbage

- Target pests: Diamond back moth, bacterial soft rot, etc
- COY mixture, Bt, Neem, etc: single or mixing application
- Application: 7-day intervals after transplanting Chinese cabbage
2. Organic cultivation of lettuce

- COY alone effectively controls powdery and downey mildews and suppress mite of lettuce, while it does not control thrips on lettuce effectively.

- However, application of COY and neem oil/pepper seed extract at 7 d intervals effectively controls the thrips on lettuce.
Organic tomato is successfully produced in a farmer’s field by using integrated technologies

- **EXTN-1**: Seedling dipping and drenching 2 times
- **COY mixture**: Spray every 7-10 days from planting
4. Organic cultivation of pepper

Organic pepper is successfully produced in a farmer’s field by using integrated technologies

- **Selection of resistant variety**: *Phytophthora* blight
- **Rain protection facility installation**: Anthracnose
- **Plant extract (Neem extract)**: Aphid
- **Net/pheromone**: Tobacco budworm moth
Future Plan
Organic farming technology dissemination

- Publication of organic farming guide book/booklets
- Farmers’ education/training: Central/local government
- Uploading organic technologies on webpage (www.nongsaro.go.kr)
이번엔 환기류병・응애 등의
병제에 효과가
뛰어난 착물보호제
향류유용요.

① 물 100㎖와 달걀노른자 1개를 믹서기로
1~2분간 갈아준다.
② 카놀라유 60㎖를 첨
가해 3분 이상 강하게
갈아준다.
※기름방울은 잘게 부
술수록 분산과 전착이
잘되며 방제효과도 높
어진다.
③ 물 20℃가 담긴 통에 나향유
을 부여 굽고루 섞는다.
④ 나향유를 분사하면 해
충은 호흡을 둔하고, 병원
균은 세포벽이 녹아 응애・
가루이・깡지벌레・닦가루
병에 효과적이다.
⑤ 나향유는 만든 즉시 사
용하고, 남을 경우 냉장고
에 4~5일간 보관할 수
있다.
※ 5℃ 이하로 출거나 35℃ 이상 더
운 날에는 사용 금지!
※지나치게 자주 살포하거나 카놀라
유가 기준량 이상 첨가되면 작물의
숨구멍이 막혀 생육이 지하되거나
과사한다. 또 부작용의 노출이 막힐
수 있으므로 사용한 후 잘 씻어 보관
한다.
⑥ 나향유는 예방 목적인
경우 10~15일 간격으로
계속 살포한다. 치료 목적
일 때는 5~7일 간격으로
3회 정도 사용한다.

(Farmers newspaper) Let's make organic agricultural material: COY
Strengthening plan of Organic Agriculture Research

Expansion of organic research field

So far

Applied technology & spread
- Basic organic farming tech.
- Organic pest management
- Organic seeds
- Soil & nutrient management
- Organic material use
- Publication

Afterward

Basic technology & sharing
- Public concern
- Ecological service
- Bio-diversity
- Carbon reduction
- Agricultural produce processing
- Reduction of climatic changes
- Environment impact assessment

Organic research funding: more than 3.6 million US$

Public-private partnership scheme & int’l cooperation
- Public-private partnership: Organic technical committee, Organic farming research, Organic fruit association, etc.
- International cooperation: IFOAM, FiBL, AFACI-ANSOFT, TI, NARO, CAAS, etc.
International cooperation: Joint researches

Institutes
• FiBL*(Switzerland), TI*(Germany), NARO(Japan), CAAS(China)

Researches
• Control of apple pests using vegetation management (FiBL)
• Assessing the Environmental Eco-benefits of Organic Farming (TI)
• Characterization of soil properties of organic farm land (NARO)
• Eco-compensation by promoting environmentally-friendly agricultural technologies in China and South Korea (CAAS)

MoU and Kick-off(TI)
Vegetation management(FiBL)

* FiBL: Switzerland Research Institute of Organic Agriculture, TI: Thünen Institute
Planning: One Doctor - One Farmer

**Background**

- Cooperation between RDA researcher & organic farmer
- Discovery of on-farm demand and new project
- Spread of practical organic technology to organic farmers

☞ suggestion of organic farmer in 20th organic technical committee (Oct. 28, 2014)

**Main Activities**

- (On-farm demand) finding the needs of farmers and new organic project
- (Consultation) expert advice and resolve technical problems on organic farming
- (Communication) providing the newest tech. and understanding on-farm problem

- It will be started from July, 2017
## Public-private partnership: Organic technical committee

### Function
- Public(RDA)-private (organic farming organizations) joint council

### Member
- Rural Development Administration, MAFRA, NAQS, NH, Farmers, Environmental agriculture organizations, Professors

### Activities
- Discussion of organic agriculture research & cooperative plan
- Planning early settlement of organic agriculture in Korea
- Dissemination and promotion of Organic farming technologies

![Presentation of research plan](image1)

![Issue discussion](image2)

![On-site visit](image3)
International cooperation: Collaboration project with IFOAM

Function
- Cooperation and project implementation between RDA-IFOAM

Budget
- $70,000/year

Activities
- Management of the Organic Farming Innovation Award (OFIA) committee
  - Award to people or organization contributing to innovative organic tech. at Organic World Conference (OWC)
  - 1st OFIA: Namyangju, Korea, 2011 (17th OWC)
  - 2nd OFIA: Istanbul, Turkey, 2014 (18th OWC)
  - 3rd OFIA: New Delhi, India, Nov. 10, 2017 (19th OWC)
- Organic Agriculture Academy for (Korean) Extension Agents (OAAEA)
**Objective**

- To share organic farming technology and information
- To create working group and continue information exchange programs
- To promote organic farming system for sustainable development
- Establishment of a model organic agricultural village

**Members**

- Bangladesh, Bhutan, Cambodia, Indonesia, Kyrgyzstan, Laos, Mongolia, Myanmar, Nepal, Philippines, Sri Lanka, Thailand, Vietnam, Korea (14 countries)

**Activities**

- AFACI Homepage Construction for activation of organic networking
- Construction of Intra-national organic farming network
- Publication of organic farming technologies/Workshop/Symposium
- Development of a model organic agricultural village
Conclusion
Increase of the area of certified organic products and the number of certified organic farms in Korea, 2016. * (2015) 60,018 (4.5%) → (2016) 61,940 (5.7%)

- Reinforcement of R&D on organic farming for the increase of organic farms.
- Maintenance of researches on soil & nutrient management, crop disease-pest-weed control, organic seeds, and organic agricultural materials
- Reinforcement of researches on the safety and functional ingredients of organic products, biodiversity, carbon storage and climate change, processing of organic products, environmental impact assessment by organic farming practice, and organic management technology for local special crops to solve effectively farmer’s on-site needs
- Rapid spread of developed organic technologies to farmers in Korea
- Continuing international cooperation among Asian countries for the improvement of organic crop production.
Organic agriculture inception

Establishment of organic farming foundation
- Political/institutional support
- Environment-friendly agriculture 5-year rearing policy

Settlement of organic agriculture
- Technical system, dissemination & spread
- Security of competitiveness

Eco-paradise
- Eco-friendly organic agricultural village
Thank you for your attention!
Certified area of environmental friendly agricultural production and the number of farms

- 79,000 ha (4.7% of total agricultural production area in Korea)

* Area: ('01) 1,700 (0.1%) → ('12) 127,000 (7.5) → ('15) 75,000 (4.5) → ('16) 77,000 (4.7)

* Farms: ('01) 2,000 (0.2%) → ('12) 107,000 (6.1) → ('15) 60,018 (4.5) → ('16) 61,940 (5.7)

(NAQS, 2016)
Certified area and no. farms for environmental friendly agricultural production in organic and no-pesticide (2015~2016)

* Certified organic area: ('15) 18,143 ha → ('16) 19,862 (9.5%↑)
* Certified organic farms: ('15) 11,611 → ('16) 12,896 (11.1%↑)

(NAQS, 2016)