Great earthquake,Tsunami and radioactive pollution

Organic agriculture movement to overcome disaster

The 17th IFOAM OWC 2011

Gyeonggi Paldang, Korea

Uozumi Michio,
JOAA vice-president

Ladies, and gentlemen, from all over the world,
let me begin by apologizing to all of you.

1) **I want to deeply apologize to everyone in the world for the radioactivity from our country that has polluted the atmosphere, the soil, and the ocean on the earth.**

2) **We also sincerely wish to express our gratitude for the warm support from so many countries.**

3) **The Japanese Organic Agriculture Association (JOAA) has been encouraging the organic agricultural movement for 40 years. We are determined to do our best to get over this difficulty of the earthquake and radioactive contamination through the organic agricultural movement. Our wish is to be united with people in the world, and creating a world without radiation poisoning.**

4) **I also want to speak about the core that ties the life in the world together. I want to discuss the meaning of "humus" in organic farming, and how the continent and the ocean are connected through humus. We call this the "River-basin area self-sufficiency through humus, connecting forests, farms and the ocean."**

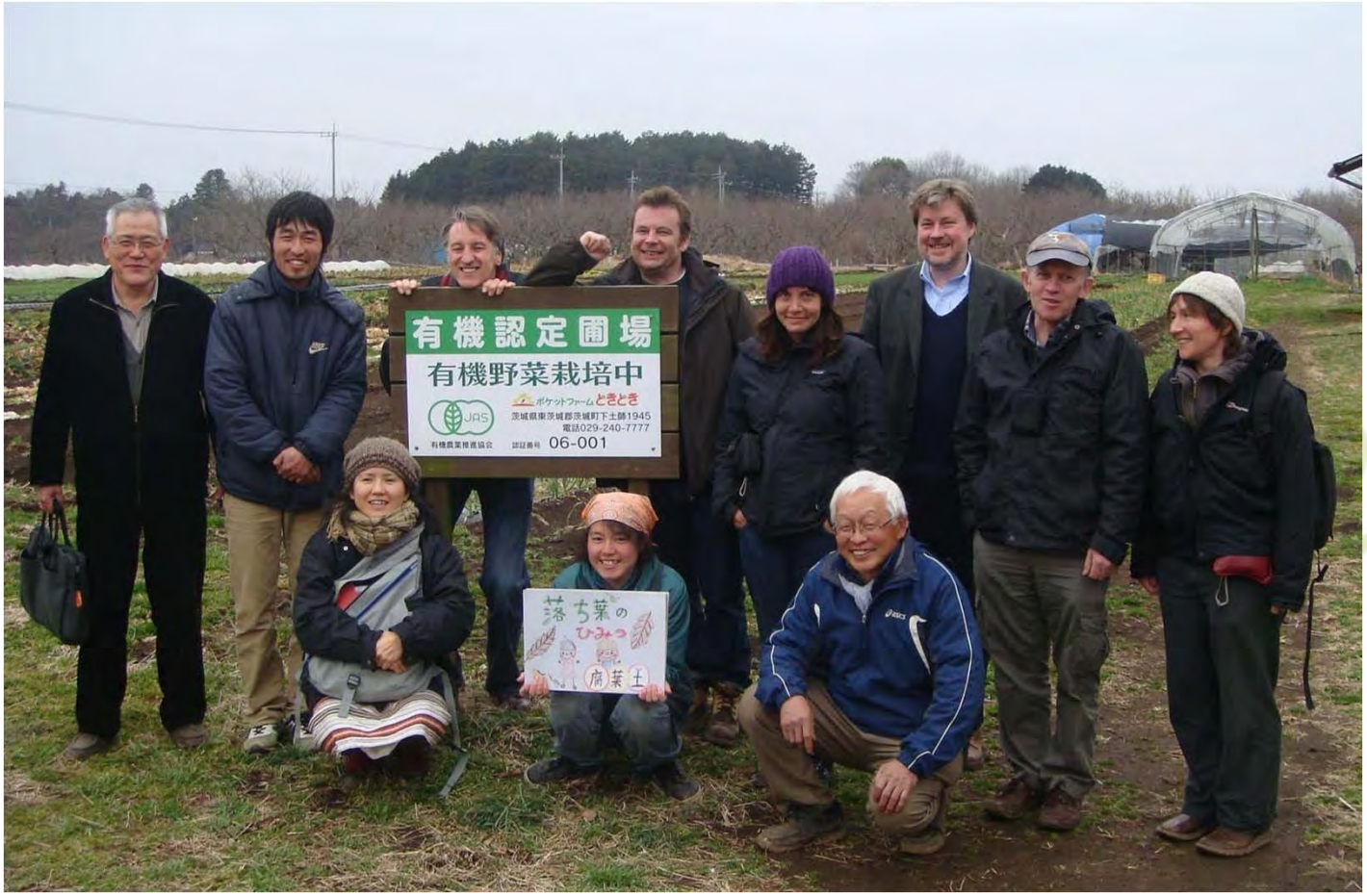
Outline

1) Ten days before the great earthquake
2) March 11, 2011 East Japan great earthquake and nuclear accident
3) Bringing rescue, reconstruction and support to the stricken areas
4) Ocean revival through organic farming and forest-farm-ocean cooperation
5) Mother Earth: Organic farming and radioactive contamination
6) Conclusion

Ten days before the great earthquake
With our companions from Britain

March 1, 2011
British Soil Association visits Japan

We visited the Pocket Farm Doki-Doki in Ibaraki prefecture



(Photo by Joso Co-op)

At Uozumi Farm

Explaining traditional hot bed of compost with fallen leaves in Uozumi Farm

(Photo by Joso Co-op)

Compost : the process of formation of humus

fermenting compost (later this compost is polluted by radiation)

(Photo by Joso Co-op)

Our rich soil

(Photo by Joso Co-op)

March 11, 2011 East Japan great earthquake, tsunami and nuclear accident

Tsunami

Tsunami flock to Natori Miyagi prefecture (Source: @Mainichi)

Kesennuma Miyagi prefecture

March 12, The hydrogen explosions at the Fukushima nuclear reactors

Meltdown Hydrogen explosion

March 12 Hydrogen explosion at reactor #1 (Source: BBC)

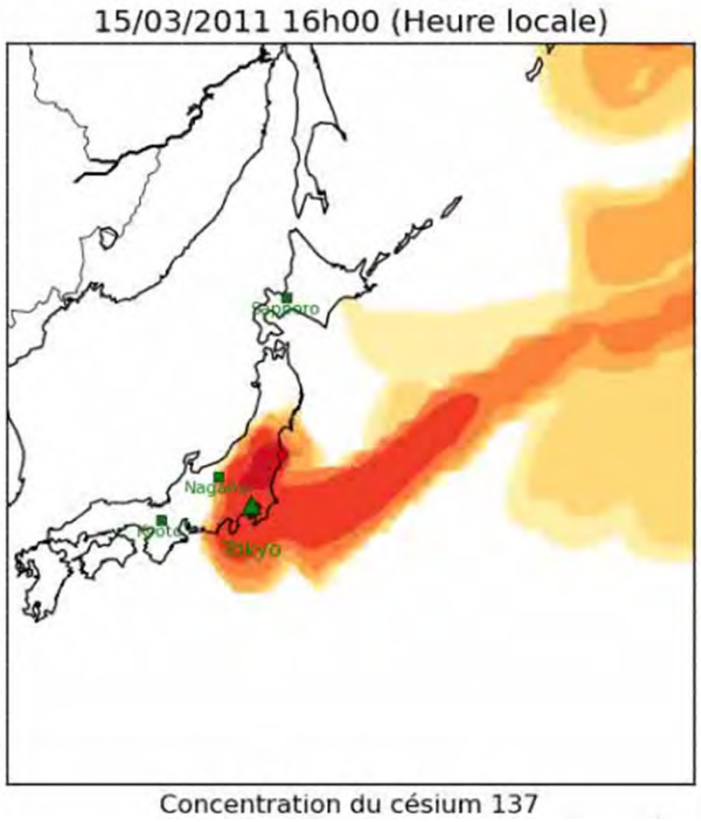
(Source: Air Photo Service Co.Ltd)

March 14 Hydrogen explosion also at react or #3 (Source: Kyodo)

March 14 Satellite image (Source: U.S. Digital Globe)

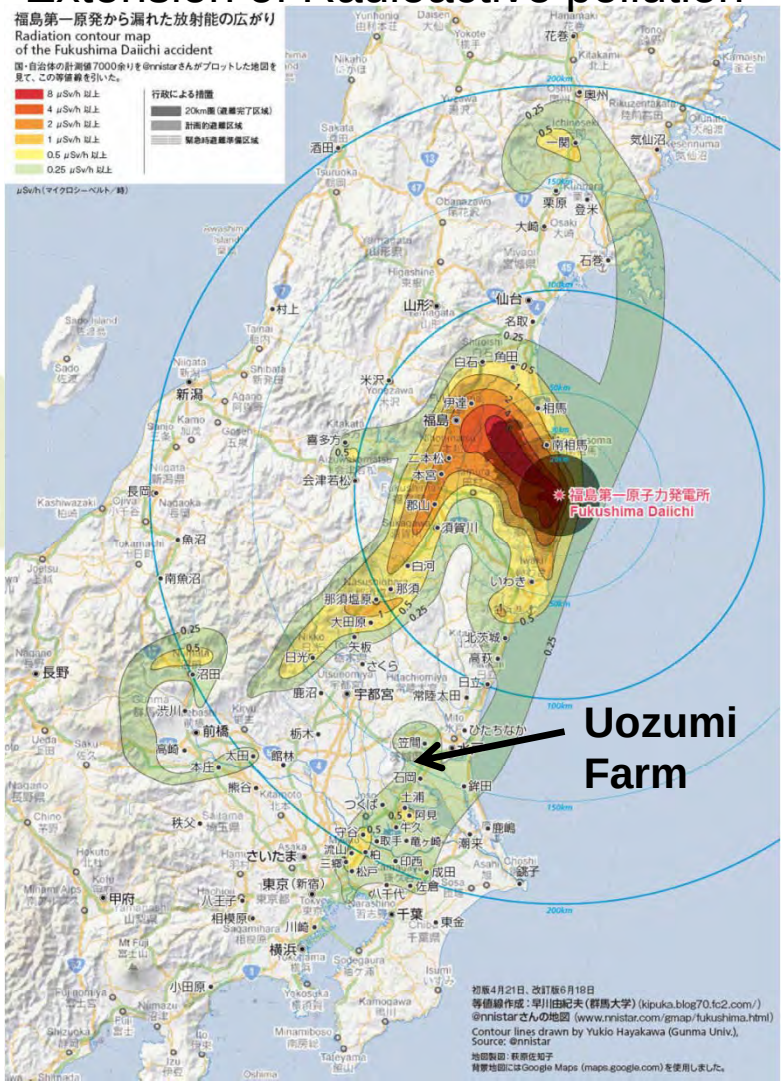
Radioactive contamination

The movement of the radioactivity plume



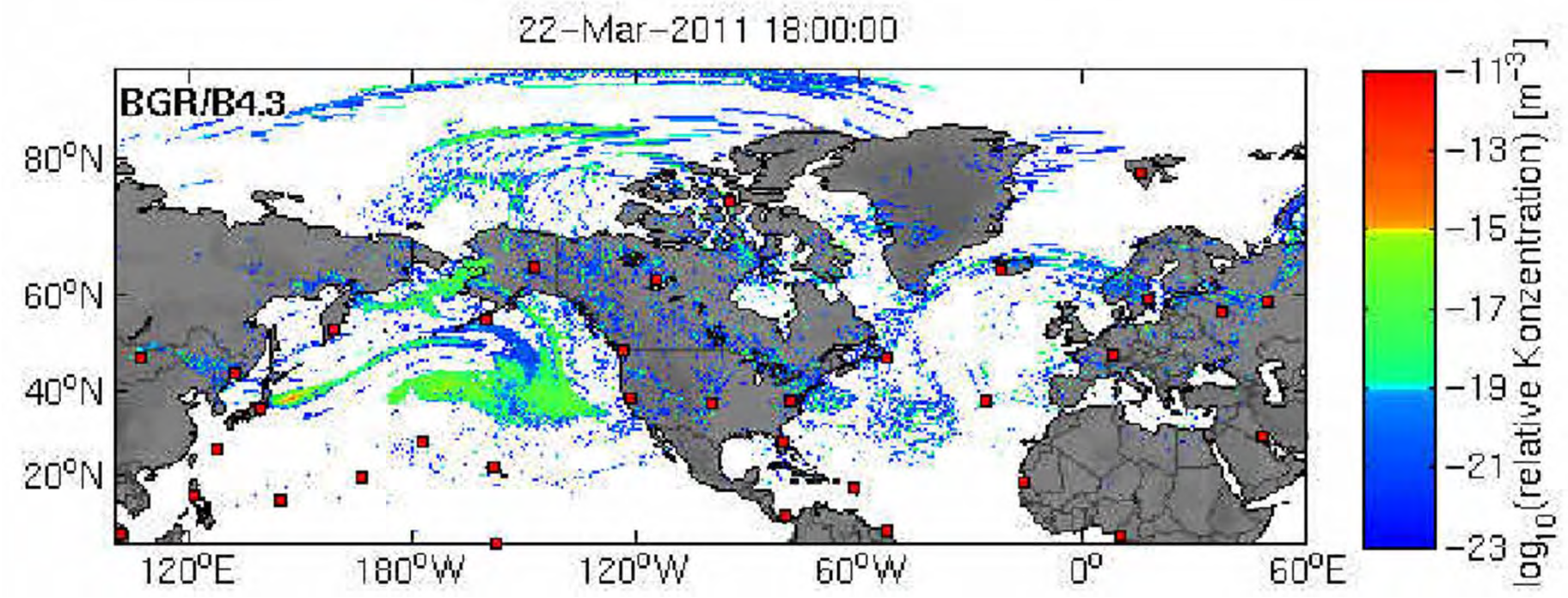
(Source: IRSN)

Extension of Radioactive pollution



(Source: Hayakawa, Gunma University)

Extension to the world of Radioactive contamination



(Source: CTBTO)

Bringing rescue, reconstruction and support to the stricken areas

Spirit of cooperation cultivated by the organic agricultural movement

“Let's become the victim’s eyes, become their ears, and their mouths”

Toyohiko Kagawa (1880-1960)*

* Japanese founder of cooperatives

Organic farmers meeting in Ibaraki for stricken area rescue and support

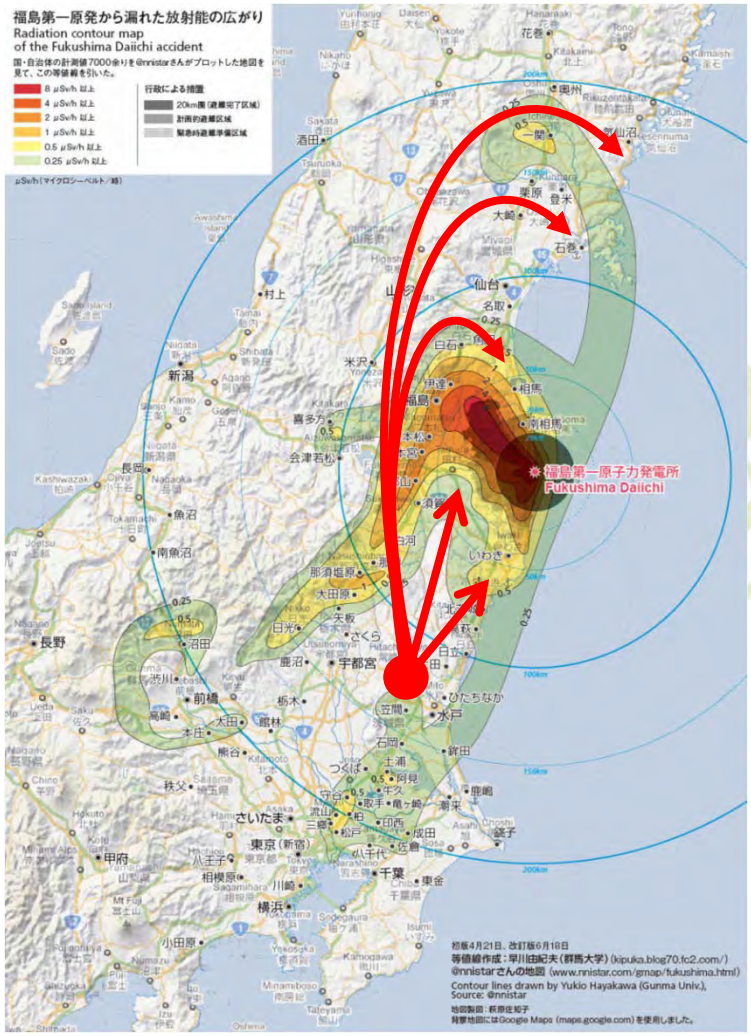
April 6, 2011

It was held in the same meeting space where we held a party for the visitors from the Soil Association one month earlier

(Photo by Joso Co-op)

Organic food was brought as support to the stricken area every week

We collect our organic foods and carried with our own hands



(Photo by Joso Co-op)

Together with people in the stricken area

Kesennuma, Miyagi prefecture

(Photo by Joso Co-op)

Bring food to the stricken area !

Kesennuma, Miyagi prefecture

Rescue operation

(Photo by Joso Co-op)

Stricken area support : With farmers and fishermen

Stricken area support: Organic farmers support the revival of local fishermen

April 2, 2011 at a liquefied ground of fish processing factory in Nakaminato, Ibaraki prefecture

(Photo by Joso Co-op)

In the stricken areas (March)

Ishinomaki, Miyagi prefecture

(Photo by Joso Co-op)

Supporting the reconstruction

April 16-21, 2011 cooperative staffs and organic farmers start the reconstruction support for the stricken area in Ishinomaki

(Photo by Joso Co-op)

Together with organic farmers in Fukushima

May 17, 2011 Support meeting for organic farmers and consumers in Fukushima

(Photo by Joso Co-op)

The forest is the lover of the ocean

Ocean revival !

Earthquake revival prayer afforestation festival

The people of the forest, the people of the sea, and the people of the farm gather together in the forest.

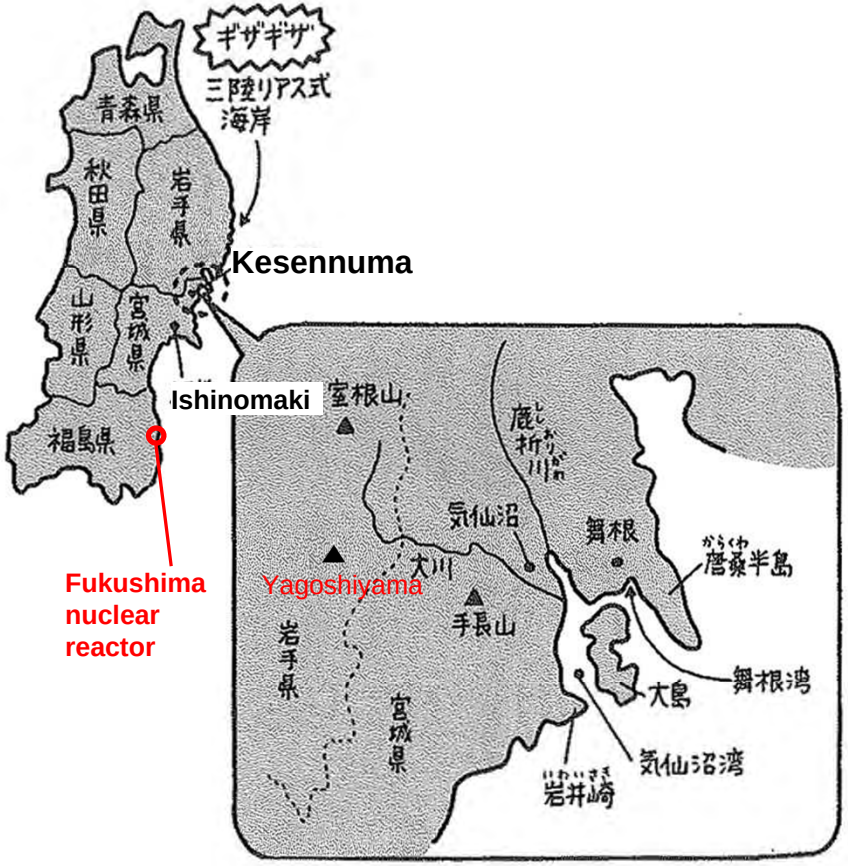
Symbol of returning to life: Hikobae (Eng. Ratoon)

Ocean revival is linked upstream rivers and mountains

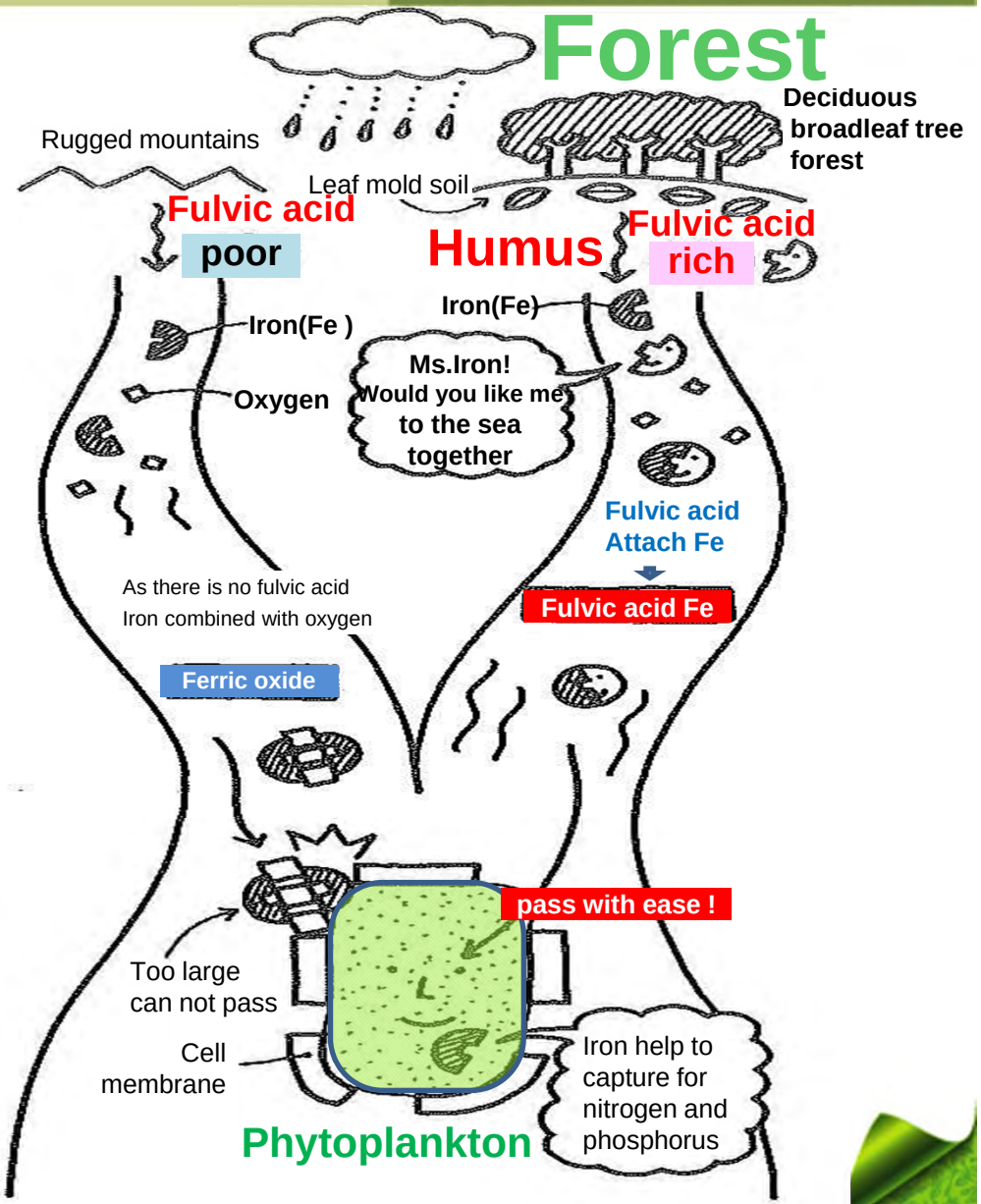
The cherished rich fishery grounds of the Kesennuma Bay are linked to the upstream region of the Okawa river reaching the mountains of Yagoshiyama, Ichinoseki,Iwate prefecture

(Photo by Joso Co-op)

Humus supply iron to phytoplankton



source S.Hatakeyama "Iron is witch"(2011)



Farmers and fishermen joining hands to plant trees in the forest

Mr. Hatakeyama, author of
“Forest is the lover of the ocean”

(Photo by K.Nakamura)

Mr. Uozumi in the hand of booklet
“The forest-farm-ocean self-sufficiency

(Photo by Joso Co-op)

Organic farmers and Teikei consumers planting trees in the forest

(Photo by Joso Co-op)

June 5, 2011
Revival prayer afforestation festival

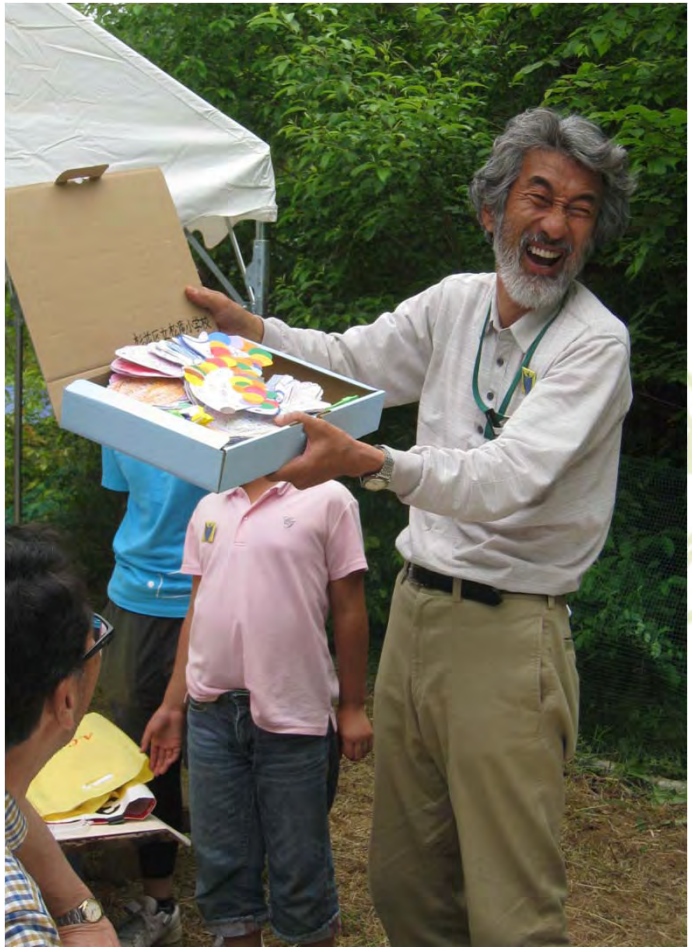
(Photo by Joso Co-op)

The forest is the eternal lover of the sea

Let's believe! We cultivate the hikobae (Eng. ratoon, sprout) spirit in our minds as we gather for the ocean

(Photo by Joso Co-op)

Mr. Hatakeyama
Parent and son of oyster fisherman



(Photo by K.Nakamura)

(Photo by K.Nakamura)

From the disaster-stricken area of Kesennuma to the mountains and forests

Fisherman,farmer,cooperative,expert discussing about the radioactive pollution and how to prevent it to the farm and sea.

(Photo by K.Nakamura)

(Photo by K.Nakamura)

Revival plan: Organic agriculture, forestry and fisheries revival project

1) Stricken area support by organic farmers and Teikei consumers after the earthquake, tsunami, and nuclear accident

2) Self-sufficiency cooperation for the river-basin that reflects the concept of "Forests, farms, and the ocean" in the revival plan

3) Revival plan proposal to aim at disaster measures and river-basin self-sufficiency

4) We expect it to be based on the function of organic humus and clay and microorganisms

5) Importance of agriculture and saving food for emergencies.Installation proposal for "Organic farming parks" with disaster prevention function in metropolitan areas and cities

The concept of "Forests, farms, and ocean connected by humus"

The forest where rich humus is originating

1)The forest life is enriched, and the mountain is maintained

2)This becomes the humus supply source for organic farming

3)All living things on the farm and in the ocean are enriched

4)This becomes biomass energy sources such as charcoal and firewood

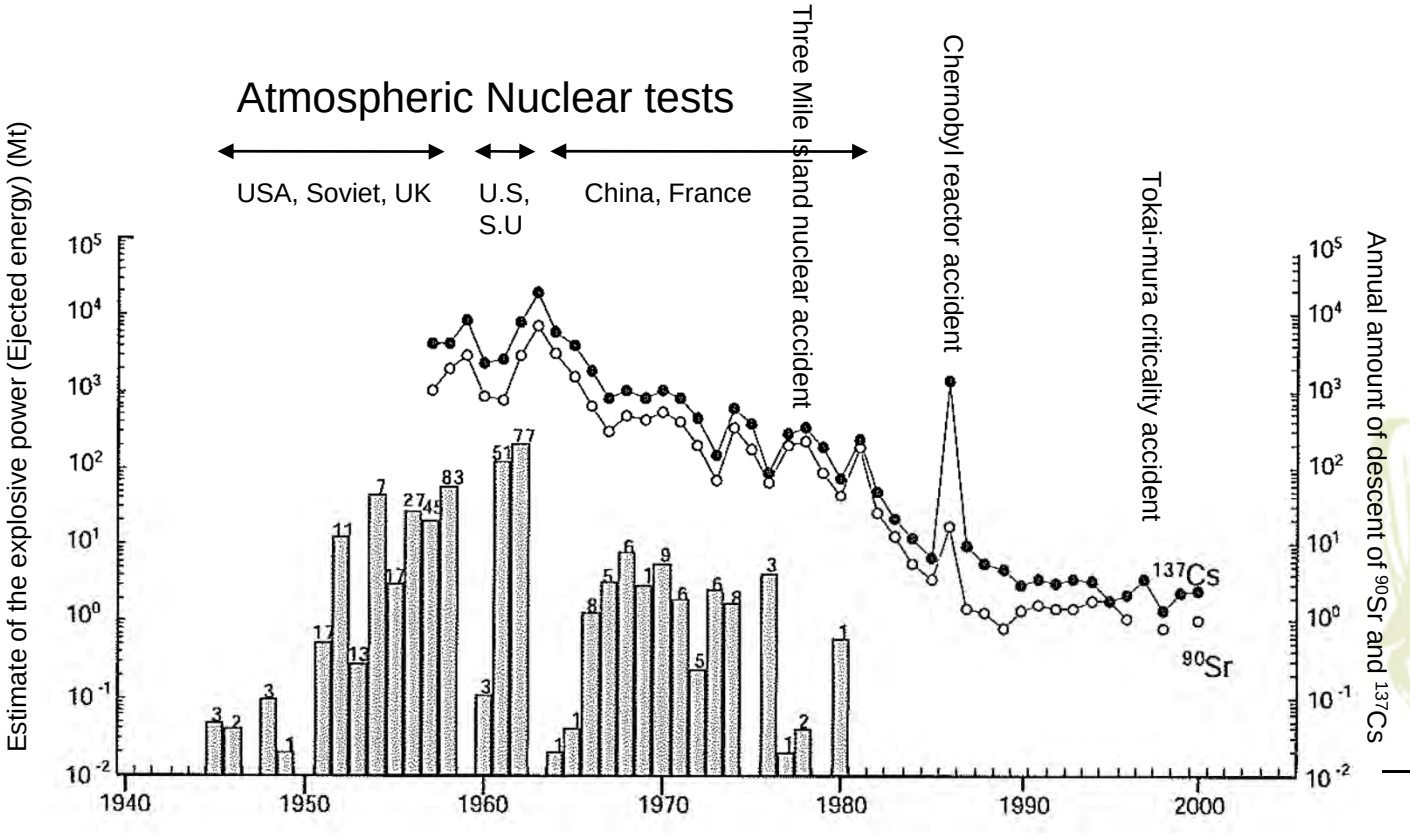
5)The rivers, underground water, lakes,marshes ,and ocean will not be polluted by materials such as radioactive substances or agricultural chemicals

Organic farming and radioactive contamination

Mother Earth adsorb and fix Cesium in the ground

The significance of the humus-clay-microorganism organic complex in the soil

Fallout of radioactive material before the accident in Fukushima



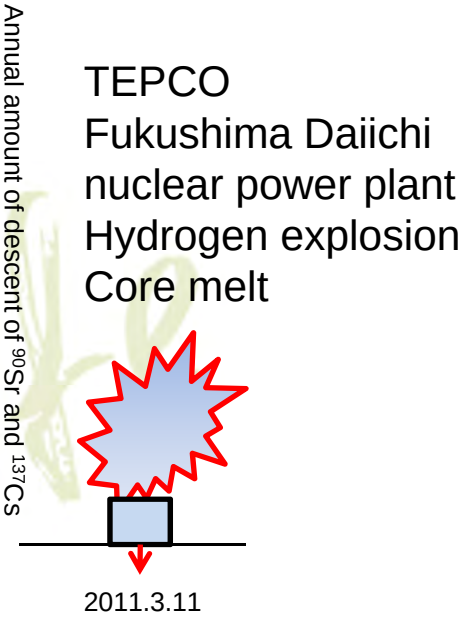


Figure 5-1 : Explosive power of nuclear explosions in the atmosphere and the number of experiments (Bar)
Annual amount of descent of ^{90}Sr and ^{137}Cs (Line)

Source : Komamura,M.Tsumura,A.Yamaguchi,N.Fujiwara,E.Kihou,N.Kodaira.K (2006)
Long-term Monitoring and Analysis of ^{90}Sr and ^{137}Cs concentration in Rice,Wheat and Soils in Japan from 1959 to 2000
Bulletin of National Institute For Agro-Environmental Sienses No.24 1-21

Concentration of radioactive contamination of soil before the accident in Fukushima

Paddy Soil

upland fields soil

^{90}Sr

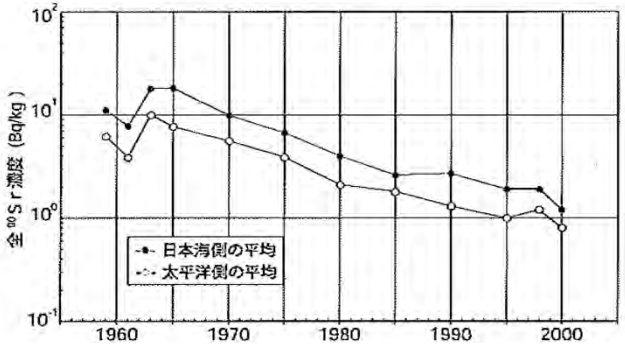


Figure 5-2 : Transition in Concentration of ^{90}Sr in plowed layer of paddy on the Japan Sea side and on the Pacific Ocean side

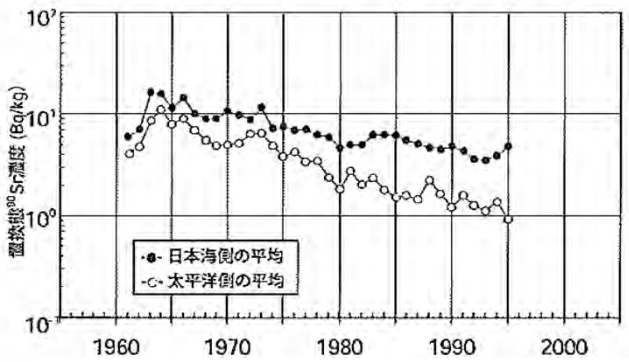


Figure 5-3 : Transition in Concentration of ^{90}Sr in plowed layer of upland fields on the Japan Sea side and on the Pacific Ocean side

^{137}Cs

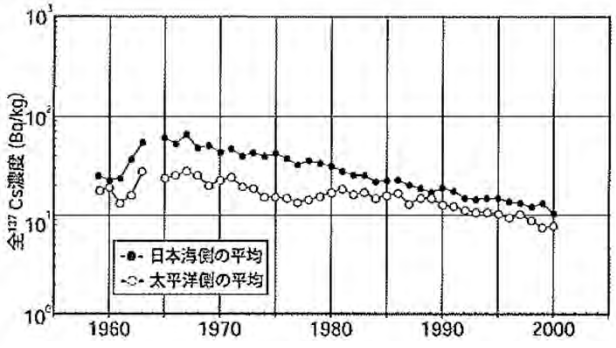


Figure 5-4 : Transition in Concentration of ^{137}Cs in plowed layer of paddy on the Japan Sea side and on the Pacific Ocean side

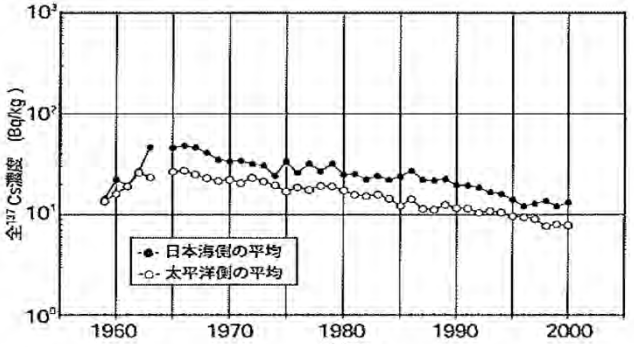


Figure 5-5 : Transition in Concentration of ^{137}Cs in plowed layer of upland fields on the Japan Sea side and on the Pacific Ocean side

Source : Komamura,M.Tsumura,A.Yamaguchi,N.Fujiwara,E.Kihou,N.Kodaira.K (2006) Long-term Monitoring and Analysis of ^{90}Sr and ^{137}Cs concentration in Rice,Wheat and Soils in Japan from 1959 to 2000 Bulletin of National Institute For Agro-Environmental Sienses No.24 1-21

Transition of contamination levels of rice and wheat before the Fukushima accident

Polished Rice

^{90}Sr and ^{137}Cs

(● Japan Sea side ○ Pacific Ocean side)

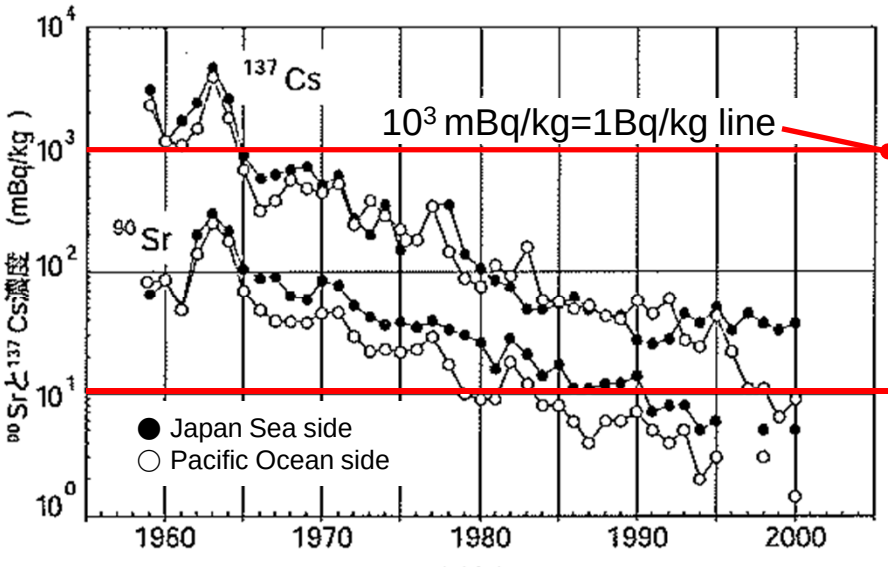


Figure 5-6 : **Transition in concentration of ^{90}Sr and ^{137}Cs in polished rice**
on the Japan Sea side and on the Pacific Ocean side

Wheat Grain

^{90}Sr and ^{137}Cs (National average)

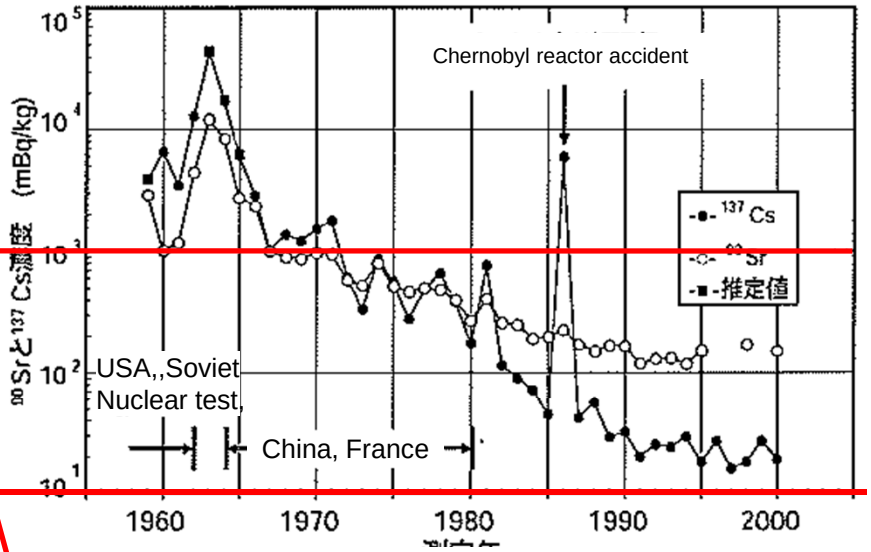


Figure 5-7 : **Transition in concentration of ^{90}Sr and ^{137}Cs in wheat grain** (National average)

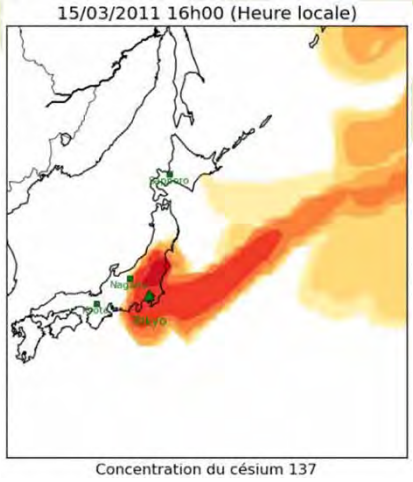
10 mBq/kg=0.01Bq/kg line

Source : Komamura,M.Tsumura,A.Yamaguchi,N.Fujiwara,E.Kihou,N.Kodaira.K (2006)
Long-term Monitoring and Analysis of ^{90}Sr and ^{137}Cs concentration in Rice,Wheat and Soils in Japan from 1959 to 2000
Bulletin of National Institute For Agro-Environmental Sienses No.24 1-21

The shock of radioactive contamination

1) Due to the radioactive contamination by this nuclear power plant disaster, many farmers and consumers felt hopeless

2) It will take a considerable time until we see the end of the nuclear power plant disaster
3) However, we did not become confused and never gave in to our worst fears

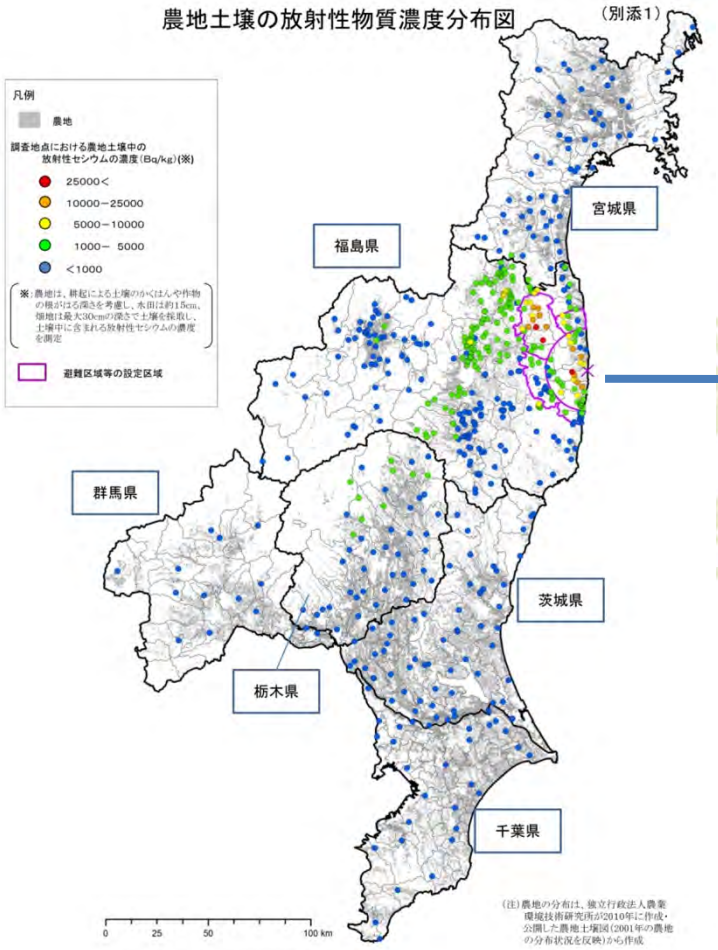


Cooperating with Teikei consumers

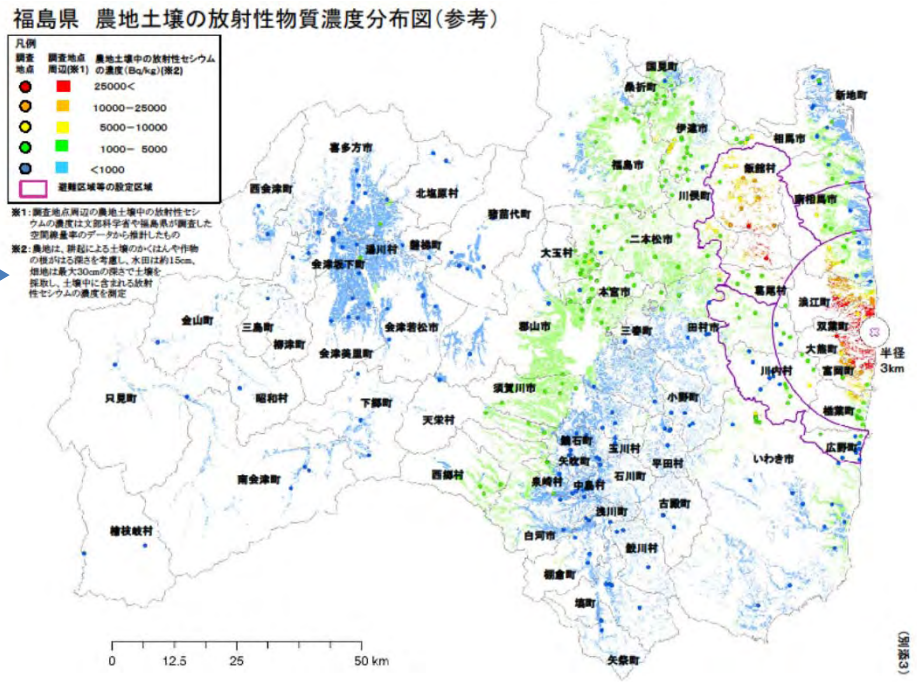
Teikei consumers came to harvest onions at the Uozumi farm where the soil was polluted by radioactive (200Bq/kg Cecium)

Soil contamination

The soil pollution distribution map which the government released

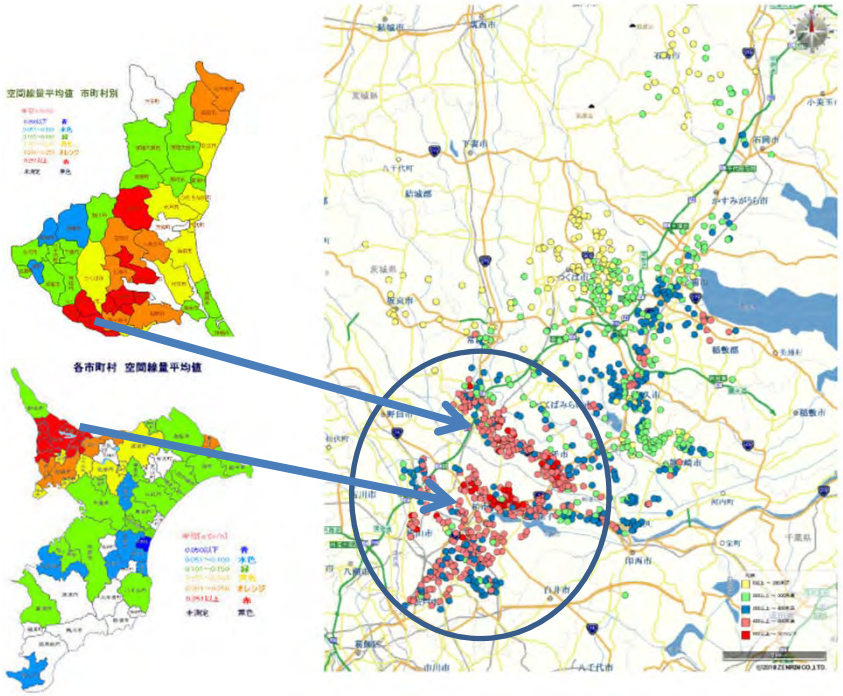


Fukushima prefecuture



Source : Radioactive material concentration distribution map of farmland soil. Source: Ministry of Education, Culture, Sports, Science and Technology (August 30, 2011)

Pollution investigation activities by citizens



Hotspots with high levels of radioactivity

市民による放射能汚染調査 茨城県取手市 空間線量（地上0～1cm nSv/h）

Action by Joso Co-op in Ibaraki prefecture

Screening of ragioactive in the organic farmland

(Photo by Joso Co-op)

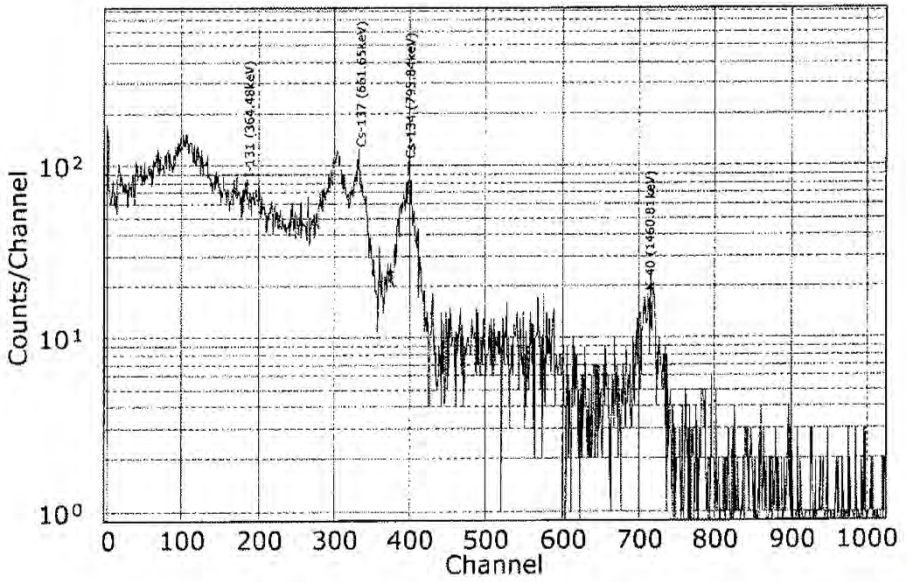
Inspection of the radioactivity soil and crops

Joso Co-op support Inspection of the radioactivity soil and crops

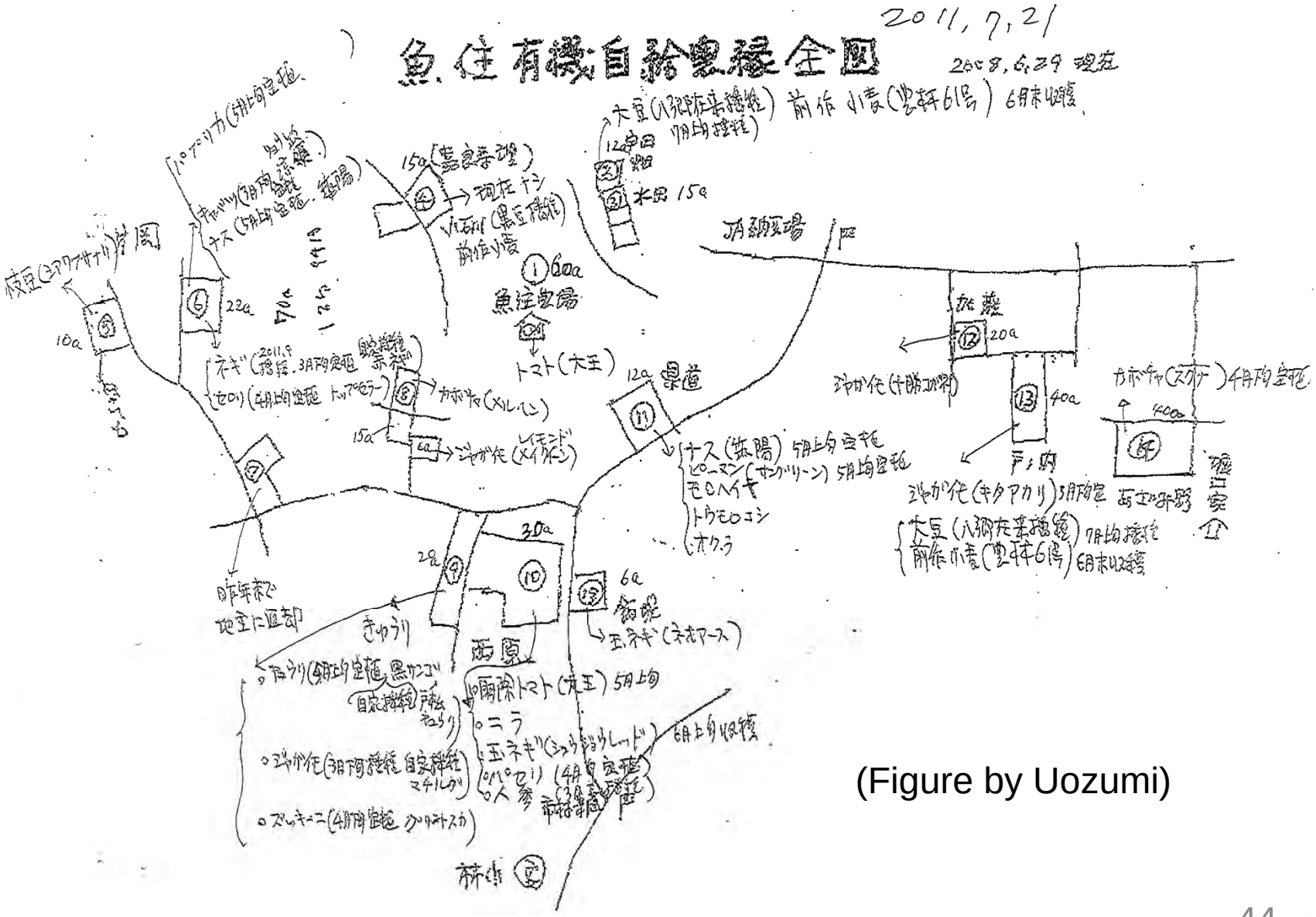
【 分析条件 】
ﾊﾞｯｸｸﾞﾗｳﾝﾄﾞ補正　：BG補正あり （ BG測定日時：2011/07/14 (木) 13:49:00 ）
減衰補正　：測定時の放射能濃度を計算 （減衰補正OFF）

【 放射能定量結果 】

No	判定	核種名	エネルギー (keV)	ネット面積±誤差 (Counts)	放射能濃度±誤差 (Bq/kg)	検出限界 (Bq/kg)
1	不検出	I-131	364.48	N.D.	N.D.	2.96E+01
2	検出	CS-137	661.65	1.07E+03 ± 7.87E+01	1.44E+02 ± 1.37E+01	3.84E+01
3	検出	CS-134	795.845	1.27E+03 ± 4.45E+01	1.87E+02 ± 1.30E+01	4.09E+01
4	検出	K-40	1460.81	2.10E+02 ± 2.23E+01	4.91E+02 ± 5.60E+01	2.98E+02



The Uozumi Farm map in Ibaraki prefecture



(Figure by Uozumi)

Soil-to-plant transfer of Cs （ 1 ）

1) Uozumi Farm (Ibaraki prefecture)

Field			Soil contamination (Bq/kg)				Translation to plant (Bq/kg)				
№	Area	Org	131I	137Cs	134Cs	Cs Total	Crop	131I	137Cs	134Cs	Cs Total
①	60a	23Y	N.D.	52.0	37.6	90	Winter melon				
②	12a	23Y	N.D.	57.3	48.1	105	Wheat	N.D.	18.0	19.3	37
③	15a	25Y	N.D.	122.0	101.0	223	Rice				
④	15a	15Y	N.D.	101.0	92.7	194	Wheat	N.D.	18.0	19.3	37
⑤	10a	20Y	N.D.	88.7	85.7	174	Green onion	N.D.	N.D.	N.D.	N.D.
⑥	22a	20Y	N.D.	84.3	89.5	174	Eggplant	N.D.	N.D.	N.D.	N.D.
⑧	21a	20Y	N.D.	117.0	103.0	220	Pumpkin	N.D.	N.D.	N.D.	N.D.
⑨	20a	15Y	N.D.	68.8	52.9	122	Potato	N.D.	N.D.	N.D.	N.D.
⑩	30a	20Y	N.D.	106.0	83.9	190	Chinese chive	N.D.	N.D.	N.D.	N.D.
⑪	12a	20Y	N.D.	86.9	84.7	172	Eggplant	N.D.	N.D.	N.D.	N.D.
⑫	20a	20Y	N.D.	118.0	117.0	235	Potato	N.D.	N.D.	N.D.	N.D.
⑬	40a	23Y	N.D.	131.0	117.0	248	Watermelon	N.D.	N.D.	N.D.	N.D.
⑭	40a	20Y	N.D.	101.0	121.0	222	Pumpkin	N.D.	N.D.	N.D.	N.D.
⑮	6a	20Y	N.D.	123.0	125.0	248	Onion	N.D.	N.D.	N.D.	N.D.

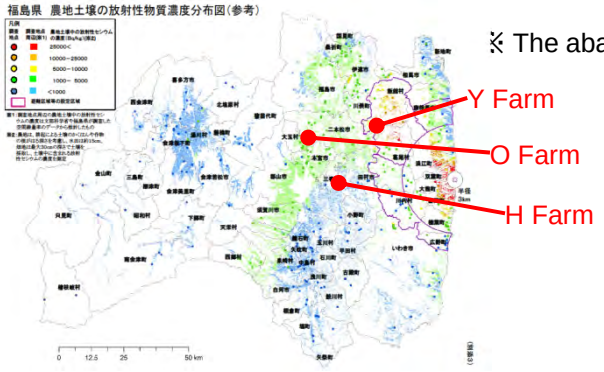
Table 5-1

Soil-to-plant transfer of Cs （ 2 ）

2) 3 different located farm (Fukushima prefecture)

farm	Field	Soil contamination（Bq/kg）				Translation to plant （Bq/kg）				
	№	131I	137Cs	134Cs	Cs Total	Crop	131I	137Cs	134Cs	Cs Total
Y Farm Kawamata	①	N.D.	17,700	15,500	33,200	Grass	N.D.	1,130	1,010	2,140
	②	N.D.	18,300	16,000	34,300	Grass	N.D.	80	66	146
O Farm Nihonmatsu	①	N.D.	1,230	1,070	2,300	Potato	N.D.	N.D.	N.D.	N.D.
	②	N.D.	965	871	1,830	Carrot	N.D.	N.D.	N.D.	N.D.
	③	N.D.	2,250	1980	4,230	Cucumber	N.D.	N.D.	N.D.	N.D.
	④	N.D.	1,620	1430	3,050	Eggplant	N.D.	N.D.	N.D.	N.D.
	⑤	N.D.	1,780	1,550	3,330	Sunflowers	N.D.	21.5	16.3	37.8
	⑥	N.D.	2,120	1,830	3,950	Rice				
H Farm Tamura	①	N.D.	704	603	1,307	Green onion	N.D.	15.5	N.D.	15.5
	②	N.D.	416	374	790					

Table 5-2



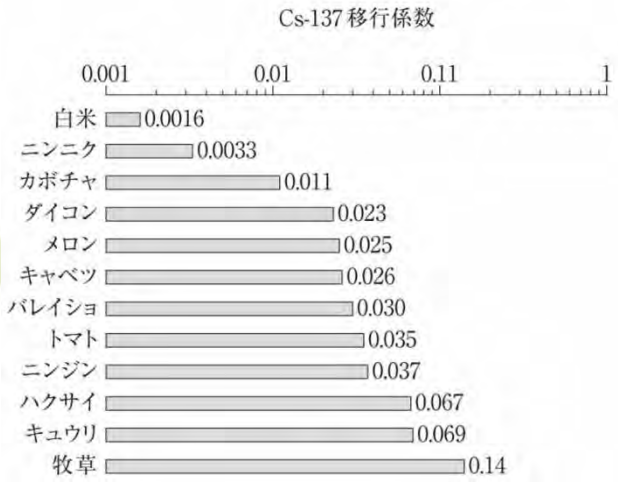
※ The abandoned Y Farm, which is located inside the designated evacuation zone

Verification result in Japan

The amount of cesium is absorbed through the roots was less than 1 / 10 of the soil contamination levels.

※Wheat seems to be absorbed from the leaf is large.

※Previous research results by Tsukada (Institute of Environmental Sciences) (right→)



※As the type and property of Japanese soil is different from Russian podzol soil, especially regarding transit factor or accumulation factor,
it is not possible to apply it as it is.

Uozumi farm's soil, the loamy layer of the Kanto Plain

Uozumi farm soil = Typical volcanic soil

(The loamy layer of the Kanto Plain/black soil, compared to clay soil)

分析項目			単位	測定値	分析方法
粒径組成	粗粒砂	Coarse Sand 2.0-0.2mm	%	7.2	ﾋﾟﾍﾟｯﾄ法「土壌標準分析・測定法」 Pipette method
	細粒砂	Fine sand 0.2-0.02mm		31.5	
	シルト	Silt 0.02-0.002mm		32.8	
	粘土	Clay under 0.002mm		28.5	
土性 Soil texture (International standard)				LiC	
粘土鉱物 Clay mineral				Allopane	Ch,Gb,It,Ch-Vt,Kn misture X-ray diffraction

Table 5-3

(Parino Survey Analysis Inc.).

sand
loamy sand
sandy loam
Loam
silt loam
Sandy clay loam
clay loam
silty clay loam
sandy clay
light clay
silty clay
heavy clay

土性区分	略号	粘土 (%)	シルト (%)	砂 (%)
砂土	S	0-5	0-15	> 85
壌質砂土	LS	0-15	0-15	85-95
砂壌土	SL	0-15	0-35	65-85
壌土	L	0-15	20-45	40-65
シルト質壌土	SiL	0-15	> 45	0-55
砂質埴壌土	SCL	15-25	0-20	55-85
埴壌土	CL	15-25	20-45	30-65
シルト質埴壌土	SiCL	15-25	45-85	0-40
砂質埴土	SC	25-45	0-20	55-75
軽埴土	LiC	25-45	0-45	10-55
シルト質埴土	SiC	25-45	45-75	0-30
重埴土	HC	> 45	0-55	0-55

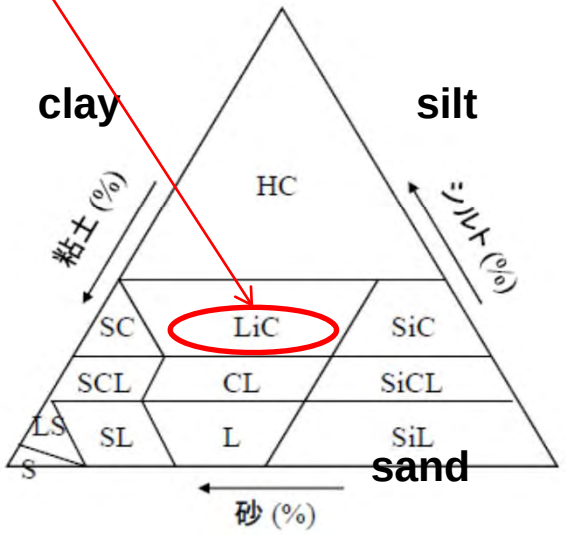


Figure 5-9

Allophane Andosol, major clay minerals

Uozumi farm soil carried the X-diffraction of clay minerals.

Major clay minerals	Clay mixed	Other Minerals
Allophane(A)	Chlorite(Ch)	Quartz(Qz)
	Gibbsite(Gb)	Plagioclase(Pl)
	Illite(It)*	Cristobalite(Cr)
	Chlorite rocks and Vermiculite (Ch-Vt) *	
	Kaolin mineral(Kn)*	

Table 5-4 * Trace level (Parino Sarvey Analysis Inc.).

Japanese Society of Soil Science and Plant Nutrition says "**70% of cesium adsorption clay, and its main adsorption of cesium is illite (2:1type clay mineral)** "

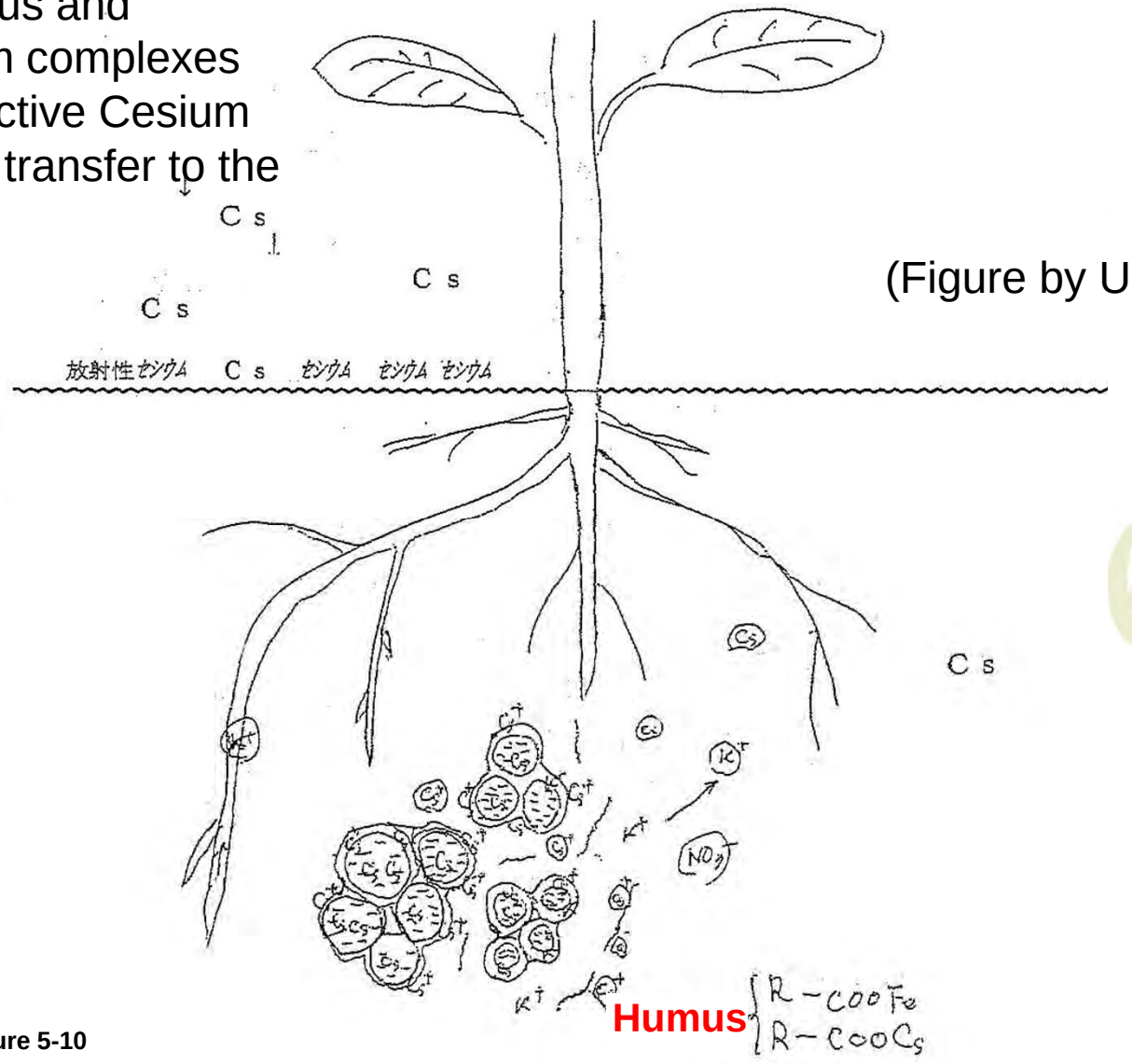
Uozumi farm soil is a typical Japanese soil : "allophane Andosol".
But **illite was only trace levels**. However the amount of cesium was less than 1 / 10 of the soil contamination levels.

Added: Uozumi farm soil's CEC was 49.4me/100g,Humus was 7.41%, Degree of base saturation was 42.7%.

Japanese Society's opinion might be biased. Will not it do not understand the whole picture of the living soil?

whole picture of the living soil

Clay and humus and microorganism complexes absorb radioactive Cesium and prevent it transfer to the crops.



(Figure by Uozumi)

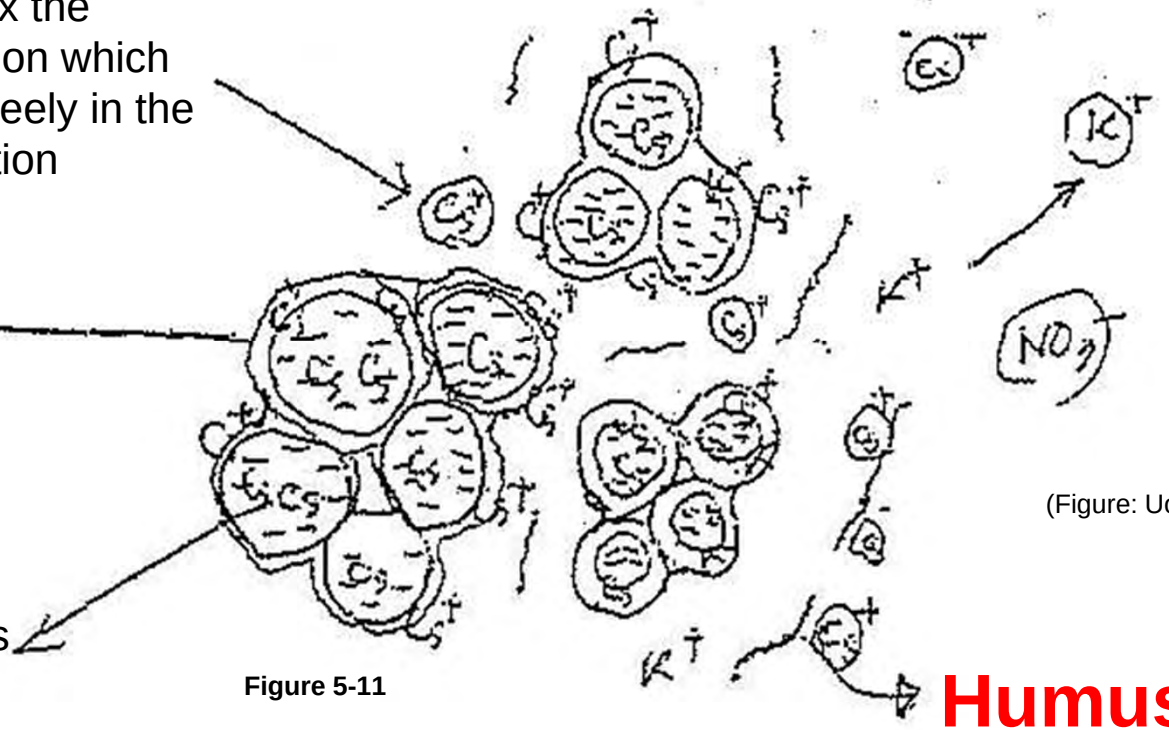
Figure 5-10

Clay particles form a aggregate structure with hummus and microorganism

Soil particles and humus fix the Cesium ion which moves freely in the soil solution

Humus forms soil particles

Clay also fixes cesium



Zeolites
adsorb Cs^+

(Figure: Uozumi Michiro)

Figure 5-11

Humus

R-COO + Fe

R-COO + Cs

※ The humus-clay-microorganism organic complex is making the aggregate. I cannot help feeling the greatness of "**Mother Earth**" in the aggregate structure of humus that coats the minute mica!**!**

Humus-clay-microorganism organic complex

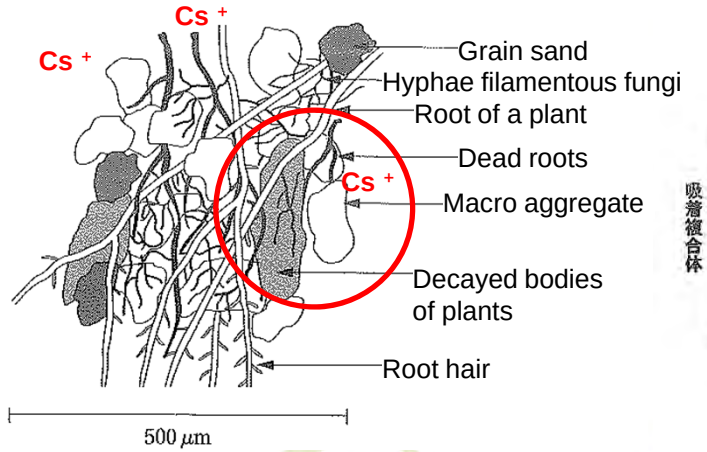


Figure 5-12
source M.Aoyama "Soil Aggregate"(2010)

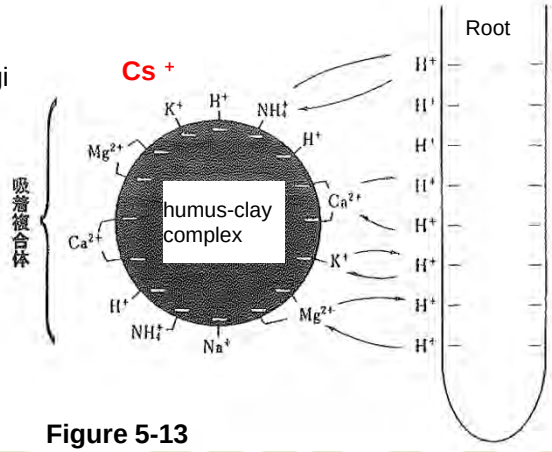


Figure 5-13
source Japanese Society of Pedology
"Love the soil and protect the soil"(2007)

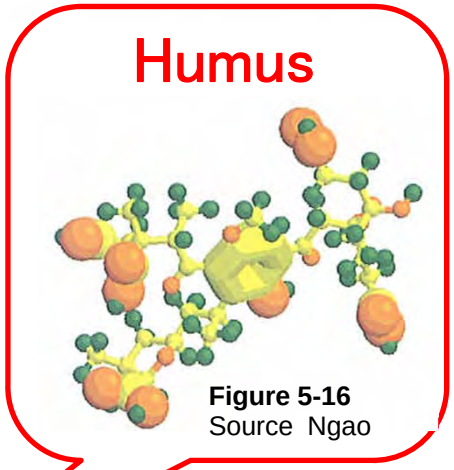


Figure 5-16
Source Ngao

Macro structure (**250μm ~ **)

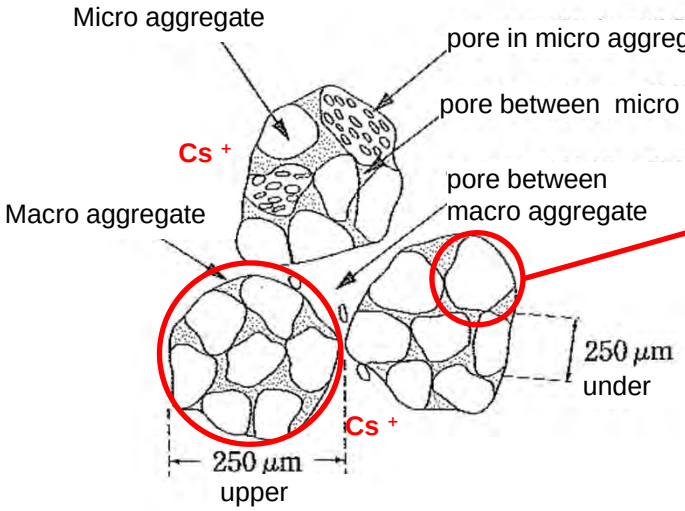


Figure 5-14

Micro structure (**~50μm**)

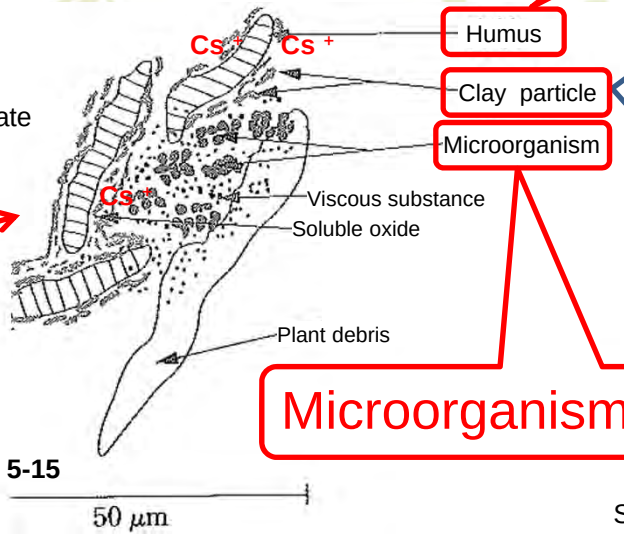


Figure 5-15

Microorganism

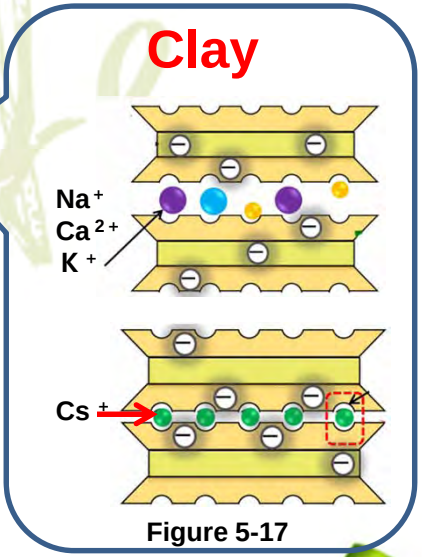


Figure 5-17
Source Japanese Society of Soil Science and Plant Nutrition

source M.Aoyama "Soil Aggregate"(2010)

Humus have high Cesium adsorption power !

Cesium is adsorbed to the carboxyl group of humus

- Humus
  - Hyumin
  - Humic acid
  - Fulvic acid
    - Hydrophilic fulvic acid
    - Hydrophobic fulvic acid

Soil microorganisms live in the space between the clay particles aggregate macro-micro aggregate.

Over 90% of microorganisms are adsorbed on the surface of humus and clay, which forms living world.

Clay Aggregate structure is due to humus and metabolic products of microorganisms

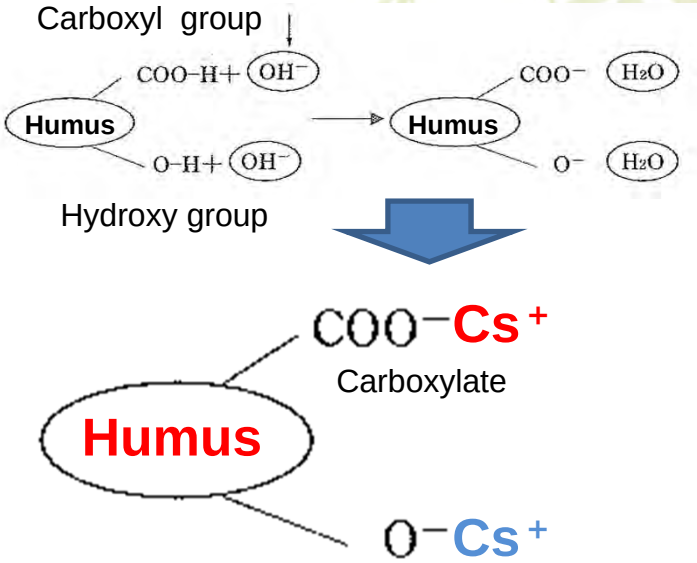


Figure 5-18

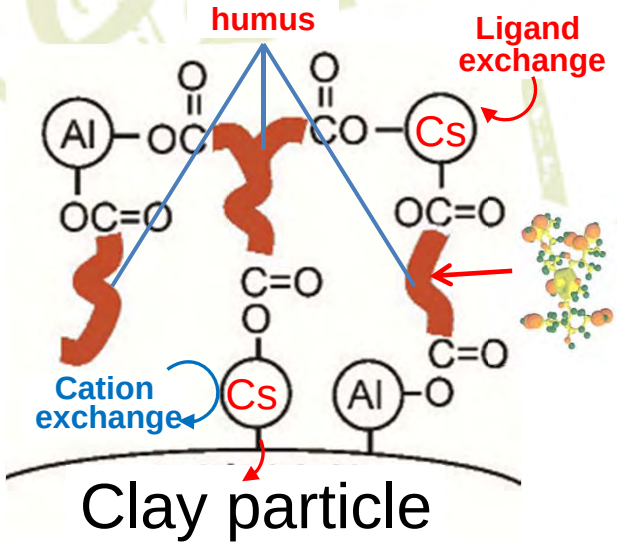


Figure 5-19
Modify "Hiradate.S "Soil Humic Substances : their Chemical Structures and Functions "(2007)

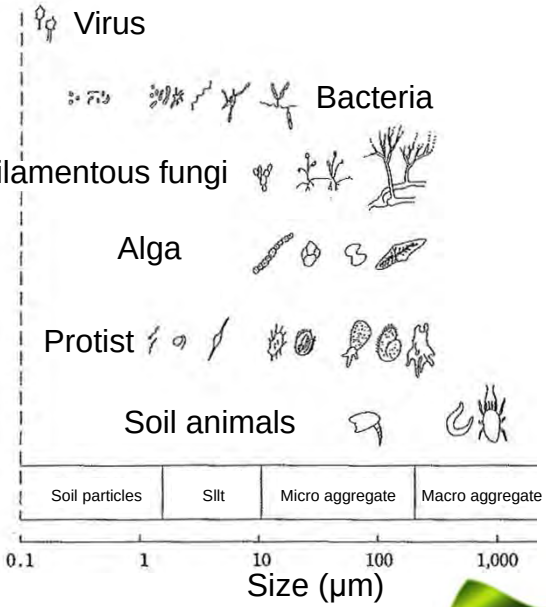


Figure 5-20

Hypothesis of Japanese Society

- The 2:1 type stratiform silical acid base mineral has a layer structure, composed of two sheets; one is a silicon tetrahedral sheet that consists of silicon and oxygen, and anoth er sheet is an aluminum octagonal sheet that consists of aluminum and oxygen. The al uminum octagonal sheet is sandwiched in between two silicon tetrahedral sheets.

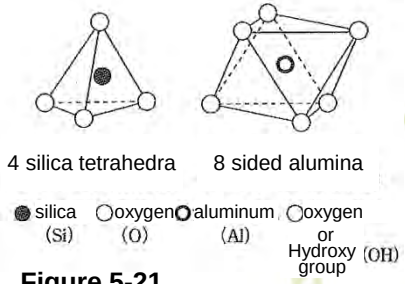


Figure 5-21

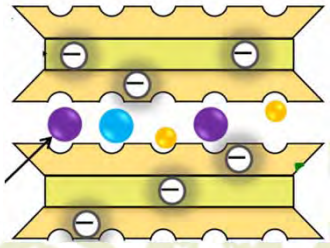


Figure 5-22
Source homepage of Japanese Society of Soil Science and Plant Nutrition

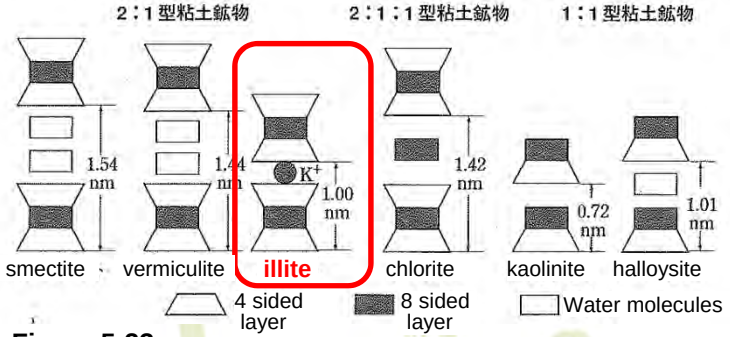


Figure 5-23
Source Teruo.Matsunaka “Fundamentals of Soil “(2003)

- As it rains and the sun shines, the radioactive cesium is slowly and repeatedly taken into the sheet of minute mica (illite) crystals. It takes time for the soil to adsorb radioactive Cesium.

Frayed edge site (FES)

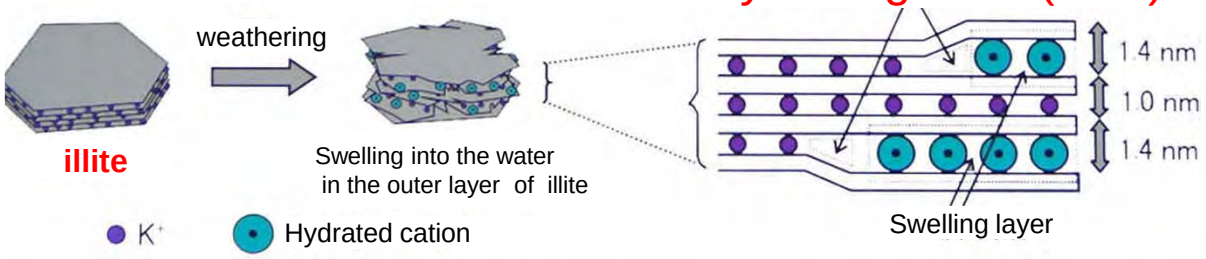


Figure 5-24 Takeda and Tsukada ‘s presentation panel in symposium of Japanese Society of Soil Science and Plant Nutrition Aug.10.2011

Ion selectivity in FES

$Cs^+ >> NH_4^+ > K^+$

1000 : 5 : 1

Ionic radius

Cs^+ 1.8 Å =0.18nm

K^+ 1.3 Å =0.13nm

Total power of the humus-clay-microorganism complex

1) The cesium is absorbed and fixed by the humus-clay-microorganism organic complex in the soil, and the shift to crops is greatly reduced

2) The CEC (Cation Exchange Capacity) of the soil is said to reveal the power to maintain the fertility and the buffer function. It consists of the collective strength of organic the organic humus-clay-microorganism complex.

3) It appears that organic farming methods which use humus have high Cesium adsorption power, and also promote the Cesium fixation. This prevents not only absorption by crops but also helps avoid contamination due to the outflow of Cesium from the cultivated land into groundwater and rivers. Thus it must be said that organic farming can play a very significant role in dealing with radioactive contamination.

4) Unfortunately, modern agricultural soil science in Japan, based as it is on reductionism and analysis, cannot understand this concept that the organic humus-clay-microorganism complex is living soil as a whole. Missing the role and the meaning of humus, they only consider the function of the clay.

The topsoil is the farmer's "treasure”

As a fisherman lives from the sea, the farmer scatters seeds on the ground and lives from it

1) Some researchers have voiced the opinion that we should not cultivate the polluted soil and instead “scrape away the topsoil and make a mountain”

2) The topsoil layer takes about 10 years or more than 10 years to be completed. The fields of organic farming are “a farmer‘s treasure.”

3) I regard it as ignorant to claim that topsoil removal will lead to safe farming

4) Organic farming cherishes the healthy crops from the rich world of the soil with microbes and humus in abundance, and circulation of organic and inorganic material

5) Healthier crops are made from enriching the topsoil linking it directly to the health of crops. By eating such crops, public health will be much improved.

6) A farmer who scatters seeds and farms his crops keeping his animals continuously, is maintaining life itself. As a fisherman lives from the sea, a farmer lives from the ground.

Meaning of humus

1) Mother Earth: The formation of aggregate of soil, water retention, breathability will help maintain a rich life in the soil

2) Plant health, livestock health, human health: This is organic farming's principle

3) An abundance of phytoplankton by fulvic acid iron, an abundance of seaweed and fish and shellfish, reviving the rich sea ... "The forest is the lover of the ocean." - Oyster farmer Hatakeyama Shigeatsu, Kesennuma, Miyagi prefecture. Hummus consist of Fulvic acid,Humic acid,and Hyumin.

4) Radioactive cesium is fixed and the absorption to crops is prevented

5) Use humus to fix the radioactivity which can flow into groundwater, rivers, or the ocean, and the contamination to living organisms is reduced

Methods to deal with the radioactivity in soil

(From the viewpoint of practical agriculture based on actual conditions in the field)

1)By using compost actively we can adsorb and fix radioactive Cesium with humus and clay. This is what helps the farmer avoid a situation where the crops will absorb the radioactive Cesium.

2)Deep tillage lowers the concentration of contamination: (Rotary, plough, subsoiler)

3)Topsoil is not scraped away.

4)Supply zeolite so that Cesium is adsorbed and does not shift to crops

Deep tillage by 32Hp tractor attached subsoiler

Subsoiler can destroy the hard subsoil and till the soil about 30-40cm depth then we can reduce the concentration of Cesium.

After deep tillage subsoiler

rotary

Promote humus production ! and "Compost Waku-Waku Movement“

1) It has been proven in the world of organic farming since A. Howa rd that humus is the key to the health of crops, animals, and hum an beings

2) Humus fixes cesium and radioactivity ceases to be absorbed into crops. We should promote the production of compost to produce more humus.

3) We should promote and extend organic farming and encourage t he conversion of the agriculture of Japan which is exposed to rad ioactive contamination. Citizens are becoming involved in conver sion campaigns to understand the importance of resource circula tion and to not waste energy.We call this campaign the Compost Waku-Waku Movement. (Note: Jp. Waku-waku means excited, th rilled)

Enhance immunity in our body !

1) Many people are anxious about the influence on their health from radioactivity

2) Our best defense against getting sick from radioactive contamination is to strengthen the function of our immune systems.

3) In order to boost the immune system, we should eat healthy crops and healthy living beings (livestock, animals) and have healthy human relationships. Organic agriculture is the foundation, and there is no other way to become healthier.

4) Soil and health: We can only maintain our health by continuing to eat organic foods filled with the vitality of the ground. In Japanese, we have the expression “身土不二” (Shin-do-fu-ji) which means, “We should not think that the body and soil are separated.” It is an ancient message from our ancestors, teaching us that we should eat the foods produced locally in the area and foods which the body request according to the season.

5) If we are anxious about radioactivity and not eating properly due to lack of appetite, it will be impossible to maintain our health. It is very important to continue eating the traditional foods of Japan, such as a lot of green vegetables with vitamins and minerals and fiber, in addition to fermented food, such as miso (soy bean paste) and soy sauce, or seaweed and cereals.

Conclusion

Conclusion

1) We found the power of the humus-clay-microorganism complex, and its buffer capacity to bind and fix radioactive materials. Cesium transition is less to crops. We are convinced that the foundation of all health is the humus of the soil.

2) After the great earthquake, tsunami and nuclear accident in Japan, we are certain that there will be much more cooperation. There is a sense of revival and regeneration as we consider the links between forests, farms and ocean. We have realized that we had forgotten how to live properly. We now have the feeling that we need to help each other.

3) Let us ignite the cooperative spirit that cultivated in the organic agriculture movement.

4) Now is the time to promote organic agriculture with strong confidence. This is our message to the world.

Thank you.
감사합니다