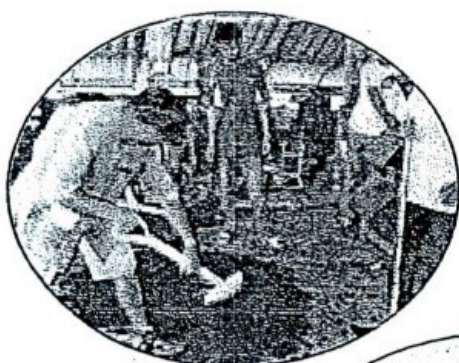




เกษตรอินทรีย์



ภาคปฏิบัติ



By

Mr. Artisapat Wansut

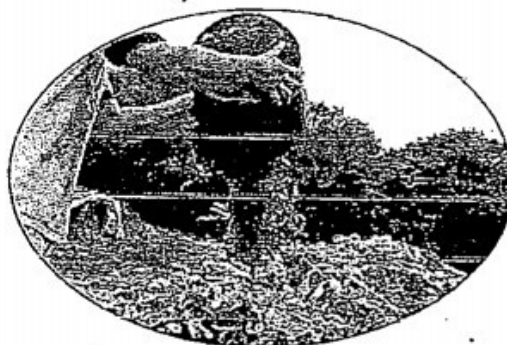
Translated by
Dr.Jakkrit Kunthong



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I would like to dedicate this book to my king his majesty's Bhumibol Adulyadej , all teachers who has tough and trained me and all farmers who dedicate their life to thai's agriculture. May organic agriculture be with us for many generations to comes.

Artisapat Wansut

“If ferment frowzy for 10 days stink will subside or 28 days disease will be gone and we get fertilizer instead. Both liquid and solid parts will not stink and are good agriculture fertilizer.

Royal speech

Given on 4 December 1999

New Agricultural Theory

Before the new agricultural theory from the royal's idea which is to grow multi-plants in the same location or to grow plant in rotation continuously. The new agricultural theory and the sufficient economic philosophy

“The new theories are difficult to follow because the person who utilize the theories must have persistence and Patient. When apply both the sufficient economic philosophy and the new agricultural theory, Thailand will prosperous but people must have persistence, be patient, must not be impetuous, blether, jangle. If follow this teaching with understanding, complacent will be resulted.

Royal speech 4 December 1996

Organic Agricultural Field Training

Organic agricultural started first in Europe and popular in USA, Canada and etc while countries in Asia is more familiar to nature agricultural often practice Japan and south Korea style. Thailand has a long history of nature agricultural with human progression of farming and life stock feeding. With the philosophy of recirculation of nature resources and natural resources optimization while follow the following principles:

1. Good health is a basic right of all living organism.
2. Good health can be applied to soils, plants, animals, and human and they all are intertwine completely.
3. First weakness in food chain is the soil, this will escalate the food chain all the way to human level.
4. Insect and animal Inflections in this modern age effects second and third food chain level.
5. Poor plan, animal and human health are resulted from low quality soils around them.
6. Human health from direct connection to second and third level food chain.
7. As soon as human respect and follow nature's reels, the sooner of the change and progression in a positive direction at which soil will be able to absorbed necessary neutrain that would benefit plans and promote the growth of microorganism in the ground.

Organic agriculture Definition:

Agriculture system that consider environment and balance between nature and variation in organisms occur in nature.

Disadvantage of Agricultural Chemical

Human has created over 600,000 type of chemical, around 10% or 60,000 of them are being use in everyday life and nearly 1,000 types are discover yearly. Chemicals use in agricultural are over 250 types are used for controlling fungi, while roughly 150 types are for weed. The Food and Agricultural Organization (FAO) of the United Nation (UN) has estimated that 750,000 people get sick and 500,000 people die from exposing to chemical use in agricultural yearly world wide. In 1946, the UN inducted the FAO due the shortage of food during the world war 2.

In 1974, Forest was cut down the most for agricultural purposes.

In 1983, Fish disease epidemic spread around the country

In 1987, 9,738 Thai farmers die from exposing to chemical use in agricultural purposes.

In 1988-1990, Survey showed that 6% of vegetables and 10% of fruits sold in the market contain amount of remaining chemical exceed safety standard

In 1993, Food and Drug Administration agency (FDA) corrected 86 samples of kale sold in Na Korn Rajsima, Na Korn Sawan, Supanburi, Pechburi, and Pracheanburi provinces and found 18% contain amount of remaining chemical exceed safety standard. Ministry of Science conducted a survey and found 97% of popular fruits consumed by Thai people contains amount of remaining chemical once again exceed safety standard. Disadvantage of chemical used in agricultural are many including reducing immunity and increase chance of a number of diseases including cancer, the number one cause of death after car accidents which is about 45,000 deaths.

Why not use crops or animals from GMOs?

Because we can not be sure that plants or animals will be safe for human consumption.

Why chemical fertilizers must not be used?

Many people believe that chemical fertilizer are safe but nitrogen fertilizer can effect user's health when successive use of these fertilizers because it will remain in both plant itself and in the water supply.

Standard of organic crops in Thailand

The last revision of organic crops standard in Thailand was on 18 October 2000 by the department of agriculture. This revision of organic standard was done so that it would comply with the standard currently used by the International Federation of Organic

Agriculture Movement (IFOAM) widely accept in European nations and verified by the International Organic Accreditation Service (IOAS) organization network (PESTICIDE NETWORK ACTION : IPNA). This network organization are part of a movement in United Kingdom and Netherlands.

Organic Crops Standard

1. The land must not located within the environment below standard
2. The land must not located within the environment below standard
3. The land must not contain remaining chemical
4. Seeds must not contain remaining chemical
5. Seed must not come from Genetic Modification Organisms (GMOs).
6. All production factors must meet standard
7. Production process must be free of synthetic chemical contamination
8. Production must promote a variety of biological growth and environments
9. Must accredit by official.
10. Away from factory, hospital, road, and near clean water supply.
11. Have the history of the land (history of crops growth and fertilizer used)
12. Observe and collect sample (water, soil, etc) for further analysis

Management and Preparation Plan

1. Plan to protect toxic chemical from outside (the ground, water and air)
2. Please to protect toxic chemical from inside (water management, irrigation, equipment maintenance, and farm access)
3. Crops planting and crops decease, crops repel insects
4. Select crops gene by considering soil condition, weather, diversity of crops.
5. Avoid using GMOs crops
6. Use seed that comes from organic crops if possible

Soil treatment

The following substances or chemicals must not be used in soil treatment

1. sewage sludge chemical sediments
2. Any kind of growth compounds
3. Any kind of genetic modification micro organism
4. Any kind of heavy metals
5. Fertilizer from urban wastes

Allowable substances for soil treatment

1. Organic fertilizers from natural crops or organic agriculture wastes
2. Life stock fertilizer that does not come from GMOs
3. Fresh fertilizer from farms that is in the from of organic
4. Synthesis free peat soil
5. Accredited organic soils
6. Substances or chemicals free soil (1 years old minimum)
7. Biological fertilizer or microorganism found in nature
8. Organic fertilizer from worm and insect wastes
9. Ferment human wastes
10. Seaweed products
11. Liquid organic fertilizer from plants and animals
12. Wests from production process of slaughter house, sugar, cassava, or fish source plant. These plant must not use harmful synthetic chemicals and are accreditation by official

13. Liquid from plants that do not use harmful synthetic chemical compounds
14. Natural growth hormone or compounds

Organic substances for soil improvements

Rock and minerals such as crushed stone, cement grinding, phosphate, gypsum, calcium, silicate, magnesium sulfate, clay materials, feldspar, zeolites, bentonite, calcium from seaweed or sea shell crushed, ash, egg shell, bone powder, gore, rock salt, sulfur, boron, copper, steel, molybdenum, manganese, and zinc.

Chapter 1

BEAUVERIA BASSIANA

Property of Beauveria Bassiana

Ability to kill weed and other unwanted bugs such as fruit fly and brown aphid.

Usage ratio: 1:1000 spray every 5-7 days low sunlight (morning and late afternoon) in the case of inflection use the ration of 1:200 – 1:400 3 days continuously.

Beauveria Bassiana Extension

1. Water – 10 Liters
2. Beauveria Bassiana – 2 spoons
3. Cornflour – 0.5 Kilogram

How to:

1. Boil 9 liters of waters while dissolve 0.5 Kg of cornflour in cold 1 liter then put back into the hot water. Wait until water cold.
2. After water is cold, pure beauveria bassiana into it and stir gently and let it ferment for 14 days after wish is ready to use.

Chapter 2

BACILUS THURINGENSIS (B.T.)

Propriety of Bacilus Thuringensis

Ability to kill weed and other unwanted bugs such as fruit fly and brown aphid.

Usage ratio: 1:1000 spray every 5-7 days low sunlight (morning and late afternoon) in the case of inflection use the ration of 1:200 – 1:400 3 days continuously.

Bacilus Thuringensis Extension

Here is how to exten Bacilus Thuringensis (B.T.) to larger amount

Plan 1. 5 fresh eggs mix with 20 liter of fresh water, 2 tea spoon of N70, and Bacilus Thuringensis (B.T.) 5 g. Fermenting for 24-28 hours before mix with water. (Mixing ratio 1 : 500)

Plan 2. Coconut oil mix with 20 liters, 2 tea spoons of B.T. then ferment for 48 hours before water the crops. (Mixing ratio 1 : XXX)

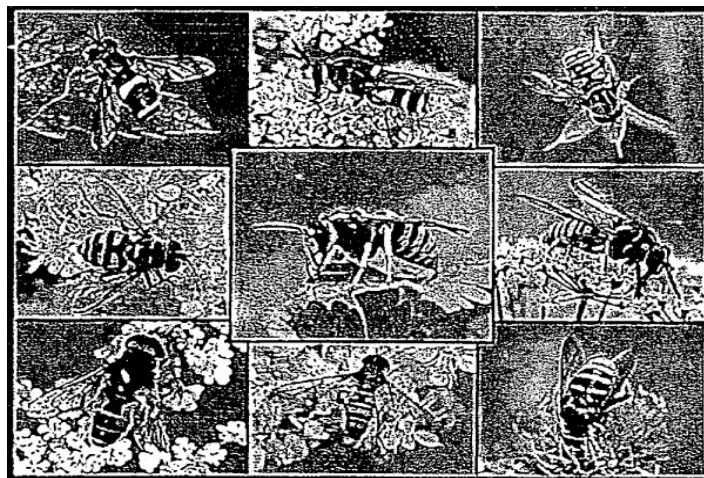
Plan 3. Soy milk or UHT milk mix with 2 tea spoon of B.T., fermenting it for 48 hours before use. (Mixing ratio 1 : XXX)

Bacilus Thuringensis in general are occurred in nature and can be used to get rid of a number of worm including neutering, caterpillar leaf vegetables, bulb onion maggots, cabbage worm, boll worm, orange worm, and palm leaf worms.

Because Bacilus Thuringensis only worm and therefore it is safe for human and other animals including birds, fish, bees, and hornet.

Bacilus Thuringensis (B.T.) Principal and How to:

1. B.T. are normally dissolved by Ultra Violate (U.V.), therefore should be used after sunset and not after run rise.
2. Worm and other bugs often located under leaves, when water them with B.T. it is important to water both over and under the leaves.
3. Never use B.T. with synthetic chemical.
4. B.T. requite time to become active and therefore should use in large dose to achieve best results.
5. When encounter epidemic, continue to use B.T. for 3-4 days.



Chapter 3

TRICHODERMA HARZIANUM

Property of Trichoderma Harzianum

Ability to prevent root rot and mold.

Usage ratio: 1:20

Trichoderma Harzianum Extension

1. Trichoderma Harzianum (T.H.) - 2 table spoons
2. Clean water – 20 liters
3. Molasses – 1 liter

Mix together and ferment for 48 hours before use.



Organic Agriculture

Field Training

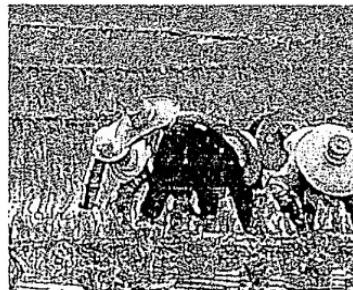
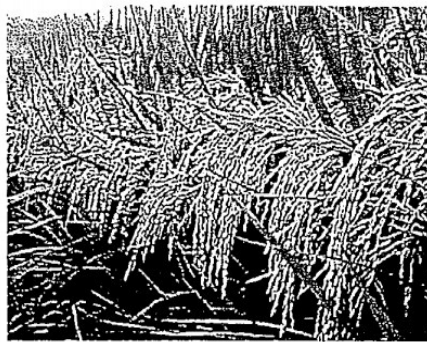


Organic Crops Production

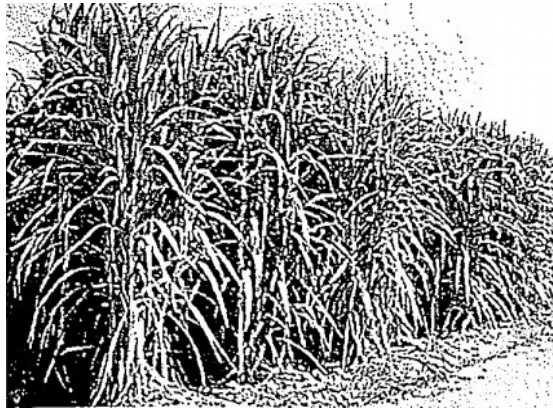
Organic field preparations

1. Choose the suitable land
2. The field is located in the open and relatively high ground
3. Must be far away from factory
4. Must be away from other farm that use chemical fertilizer
5. Must be away from main roads
6. Located close to natural water supply
7. Know pH value of the soil
8. Collect water sample for analysis
9. Plan what plant to grown what and when
10. Create environment where the plant can grown
11. Reduce machine as must as possible
12. Prepare the soil

Rice One Kwan (No Chemical)



Sugar Cain New Plan – Organic



Organic Corn



Cassava

1. Plow the soil then leave it to expose the sun for 7-10 days
2. Apply 500 - 1,000 Kg of organic fertilizer per rai (1,600 M²)
3. Plow the soil again raised beds about 1 meter apart
4. Apply organic fertilizer that mixed with Kiderma

Rice Nabok

This rice specie is suitable for consume within the family and are not for sale as it require higher degree of care and reduce the risk of contamination from harmful remaining chemical within the food.

1. Plow the soil then leave it to expose the sun for 7-10 days
2. After 7-10 days, plow the soil again and spray the banana EM evenly then turn the soil over and leave it for 7 days
3. Apply 1,000 Kg of organic fertilizer per rai (1,600 M²) then plow the soil evenly
4. Submerge 1 Kg of rice grain per rai (1,600 M²) with the following mixing, egg hormone 20 cc + banana EM 20 cc + wormwood 2 table spoons + water 20 liters for 6 hours, then wrap the grain in plastic container for another 12 hours
5. Drop 2 rice grain per pit spacing of 20-25 cm
6. After 15 days, spray banana EM 20 cc + egg hormone 20 cc + wormwood 1 table spoon and 20 liters of water every 15 days until the rice start to yield grain and before harvesting

Note: Rice nabok is suitable for high land with minimal water available

Shampoo Hair Care

Artisapat Wannasut's Formula



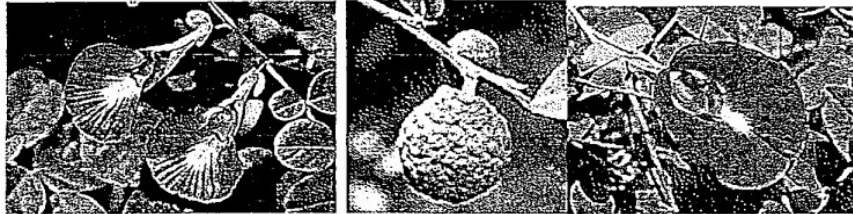
Raw materials:

- | | |
|------------------|-------|
| 1. N70 | 1 Kg |
| 2. Table salt | ½ Kg |
| 3. Water | 7.5 L |
| 4. Bergamot | 2 Kg |
| 5. Butterfly Pea | 200mg |
| 6. Fragrance | 10 cc |

How to prepare:

1. Clean and boil bergamot (whole thing, do not peel) with 7 Kg water low heat for 30 minutes

2. Boil butterfly pea with 1 cut of water on low heat until the color butterfly pea start to fade
3. Squash both bergamot and butterfly pea for their juice
4. Mix the solution with N70 and slowly stir while adding saline then add fragrance at the end



Mineral Soap

Artisapat Wannasut's Formula



Raw materials:

- | | |
|-------------------|------------------|
| 1. Yakult | 1 bottle (80 cc) |
| 2. AD25 | 1 Kg |
| 3. Table salt | 200 mg |
| 4. Mineral water | ½ L |
| 5. Coconut oil | 1 table spoon |
| 6. Eucalyptus oil | 1 table spoon |

How to prepare:

1. Desalt table salt into ½ liter of mineral water
2. Mix AD25, mineral water, and saline solution slowly until cream like solution is reached.

3. Mix coconut, eucalyptus oil, yakult along with AD25 solutions until it become cream like solution.
4. Put the cream like solution into any desired container

Turmeric Soap

Artisapat Wannasut's Formula



Raw materials:

- | | |
|-------------------|---------------|
| 1. Glycerin | 1 Kg |
| 2. Fresh turmeric | 100 mg |
| 3. Clean water | 1 cup |
| 4. Honey | 1 table spoon |
| 5. Coconut oil | 1 table spoon |
| 6. Fragrance | 30 cc |

How to prepare:

1. Cut glycerin in to small pieces
2. Pound or smash turmeric then add water to stew until 1 table spoon of solution is reached.
3. Boil glycerin on low heat then mix turmeric solution along with coconut oil, honey, and fragrance slowly.

Dish washer, detergent and All purpose solutions

Artisapat Wannasut's Formula



Raw materials:

- | | |
|---------------|-------|
| 1. N70 | 1 Kg |
| 2. Water | 7.5 L |
| 3. Table Salt | ½ L |
| 4. Bergamot | 2 Kg |
| 5. Papaya | 2 Kg |

How to prepare:

1. Clean bergamot thoroughly the boil in 3.5 liters water for 30 minutes (do not peel the bergamot skin)
2. Clean papaya thoroughly, dice in to small pieces, then boil in 3.5 liter water for 30 minutes (do not peel the papaya skin)
3. Mix salt into ½ liter water, stir for 5 minutes to create saline solution
4. Mix N70 with saline solution, stir until cream like solution is resulted, then start mixing bergamot and papaya waters slowly
5. To produce detergent solution, mix an additional bottle of soda (bicarbonate water). This step is not require for dish washer solution.

Clam/Shellfish/ Insect (Clam/Shellfish/Insects Away)

Artisapat Wannasut's Formula

Crushed Golden Flower seed 1 Kg (cream)	+	Clean water 5 liters	+	Banana EM 1 cup	+	White mortar 1 Kg
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Minimum fermentation time of 24 hours.

Usage ratio: 1 liter per 1 Rai (1,600 M²)

How to: Pure the compound onto the farm and leave it for 2-3 night before begin growing the rice

Insect Drunk

Crushed Golden Flower seed 5- 10 table spoons	+	Clean water 5 liters		Crushed Golden Flower seed cream 1 liters + water 200 liters
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Weed/Glass Killer

Banana EM 20 liters	+	Vinegar (from pineapple) 1 litters	+	All purpose 2 table spoon
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Note: Spray the weed/glass at high-noon for best result

Rice Vaccine (Bird or Rat away)

Wormwood 1 Kg	+	Clean water 5 liters	+	Banana EM 1 cup
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Ferment for 24 hours before use

How to: Rice vaccine 5 liters + 200 liters then soak in rice grain (paddy) at lease 6 hours before sow

Pineapple Vinegar

Crushed Golden Flower seed 1 Kg (cream)	+	Clean water 5 liters	+	Banana EM 1 cup	+	White mortar 1 Kg
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Rubber Tree Treatments

Clean water 5 liters	+	Banana EM 1 liter	+	Egg Hormone 1 liter
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Sprinkle or spray on the tree once every 2 weeks and Million Baht Fertilizer 2-3 Kg each tree once a year.

Formulation Summary

1. Banana EM (for soil treatments, digest blurred)

Banana EM 1 liter	+	Molasses 1 Kg
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Note: Expand formula => 1 : 1 : 40 or 5 : 5 : 200

(Molasses 1 Kg + Banana EM 1 liter + water 40 liters, fermenting for 7 days)

2. Egg Hormone (for plant & animal)

Chinken Egg 1 Kg	+	Molasses 1 Kg	+	Yakult 1 bottle (80 cc.)	+	Yeast (powder) 10 g
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3. Million Baht fertilizer (Improvements version) for soil improvements

Cow waste + Banana EM 1 liter + sugar or molasses 1 cup + water 20 liters, pure over fertilizer dump just wet enough to form shape then make the fertilizer dump high to 1 foot, cover with plastic sheet for 7 days. The million baht fertilizer will then be ready.

Help reduce harmful chemical and contamination to our
world environments by 2021
(Earth Summit resolution, South Africa 2002)

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