RICE TECHNOLOGY *Bulletin*

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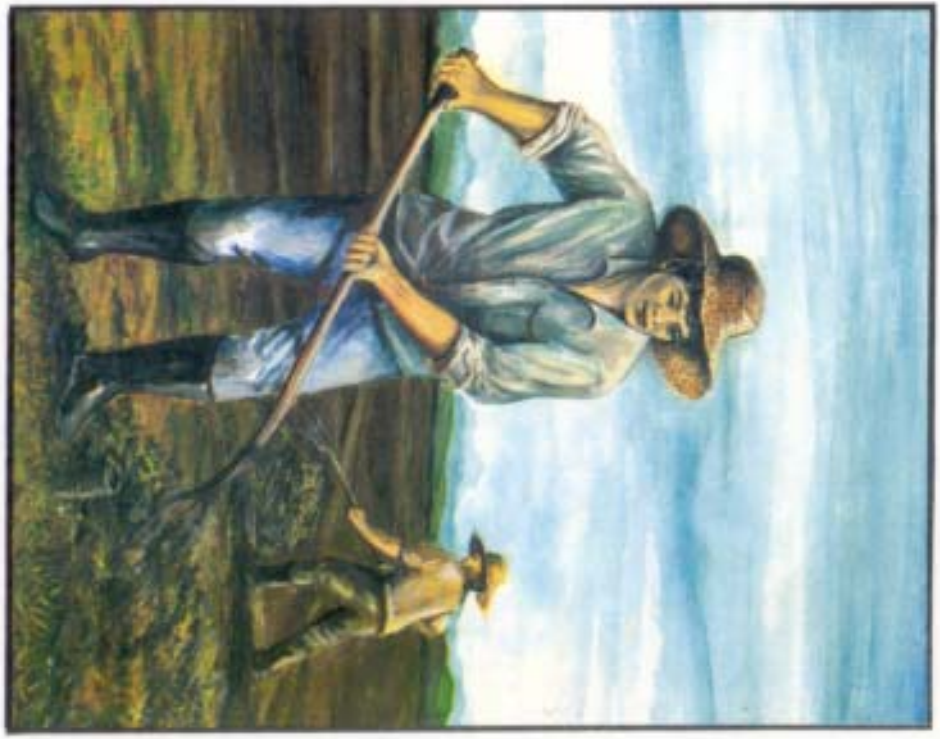

10 Steps in Compost Production

Rice Technology Bulletin Series

No. 1 Released Rice Varieties (1968-1994)
No. 2 Pagpaparami at Pagpupuro ng Binhi sa Sariling Bukid
No. 3 Paggawa ng Maligaya Rice Hull Stove
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No. 6 PhilRice Drumseeder
No. 7 PhilRice Rototiller
No. 8 Rice Food Products
No. 9 PhilRice-UAF Batch Dryer
No. 10 Integrated Management of the Malayan Black Bug
No. 11 SG800 Rice Stripper-Harvester
No. 12 Dry seeded Rice-Based Cropping Technologies
No. 13 Maligaya Rice Hull Stove

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Maligaya, Muñoz, Nueva Ecija, Philippines.

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of this bulletin with acknowledgment.

Foreword

In the past, it took rice farmers four months to turn their rice straws into compost. Few farmers adopted this technology because it took large quantities of raw materials, it was laborious to prepare and apply, and the beneficial effects on the soil were not easily seen.

Now with the use of microbial agents, crop residues and other farm wastes can be turned into compost in just three to four weeks. In fact, there is not proliferation of commercial organic fertilizer manufacturers riding on the advances in the field of microbiology and renewed government interest in organic farming.

Fortunately, with this technology, farmers can make their own compost instead of buying them. They can also go into organic fertilizer production as a livelihood enterprise with the ready availability of microbial agents and training centers in strategic locations of the country.

At PhilRice, we have found that up to 50 percent of the total N requirements of a rice crop can be substituted by organic fertilizers. This means substantial savings to the farmer, and at the same time, restoring depleted micronutrients in the soil.

As we intensify crop production from limited land, we hope to reserve our land base by returning what we took from the soil. This bulletin synthesizes the works of many scientists and institutions who have advanced composting technology, most especially Dr. Virginia Cuevas of the Institute of Biological Sciences (IBS) for developing the Compost Fungal Activator (CFA) technology, and Dr. Bayani Espiritu of the National Institute of Molecular Biology and Biotechnology (BIOTECH) for developing the Bio-Enriched compost technology. Both scientists are based at the University of the Philippines at Los Baños (UPLB), Laguna.

SANTIAGO R. OBIEN
Director

What is compost?

Compost is a mixture of decayed organic materials decomposed by micro-organism in a warm, moist, and aerobic environment, releasing nutrients into readily available forms for plant use.

Why use compost?

- There is a need for sustainable production through integrated nutrient management
- Compost produces less methane than uncomposted rice straw when incorporated in the soil
- Solves problem of declining yield.
- Corrects micronutrient problems like zinc deficiency.

Benefits of compost

- Big savings, increased farmer self-reliance
- Increases yields
- Improves soil tilth and structure
- Increases water holding capacity of the soil
- Improves aeration
- Provides humus or organic matter, vitamins, hormones, and plant enzymes which are not supplied by chemical fertilizers.
- Acts as buffer to changes in soil pH
- Kills pathogenic organisms, weeds, and other unwanted seeds when temperatures of over $60^{o}C$ is reached
- Mature compost quickly comes into equilibrium with the soil
- Different materials can be blended or mixed together which can increase the nutrient content of the compost fertilizer.

Recommended fertilizer rate

The **GINTONG ANI** program recommends basal application of 6-8 bags inorganic fertilizer and 8 bags organic fertilizer per hectare. by composting all the rice straw after harvest, this requirement is adequately met, and one does not need to buy commerciala organic fertilizers.

5 tons

rice straw

0.58%N

2 tons

compost

1.5% - 3%N*

30 kg N

* *enriched with animal manure, nitrogen rich farm residues like legumes, and acted upon by microorganisms like fungus Trichoderma sp. and nitrogen fixing bacteria, Azotobacter sp.*

3 ways of making compost

Traditional Method

This is a slow process, requiring 3-4 months before farm wastes are fully decomposed and ready for use as compost fertilizer. This means that the fertilizer can only be used after one planting season. This also requires a bigger composting area. However, this method involves only eight steps, and it is inexpensive to produce, requiring no extensive inputs except labor.

Rapid Method

With the aid of fungus activator Trichoderma harzianum, decomposition of farm wastes is accelerated to just 3-4 weeks! This means that the compost can be used in the next planting season. This involves ten steps.

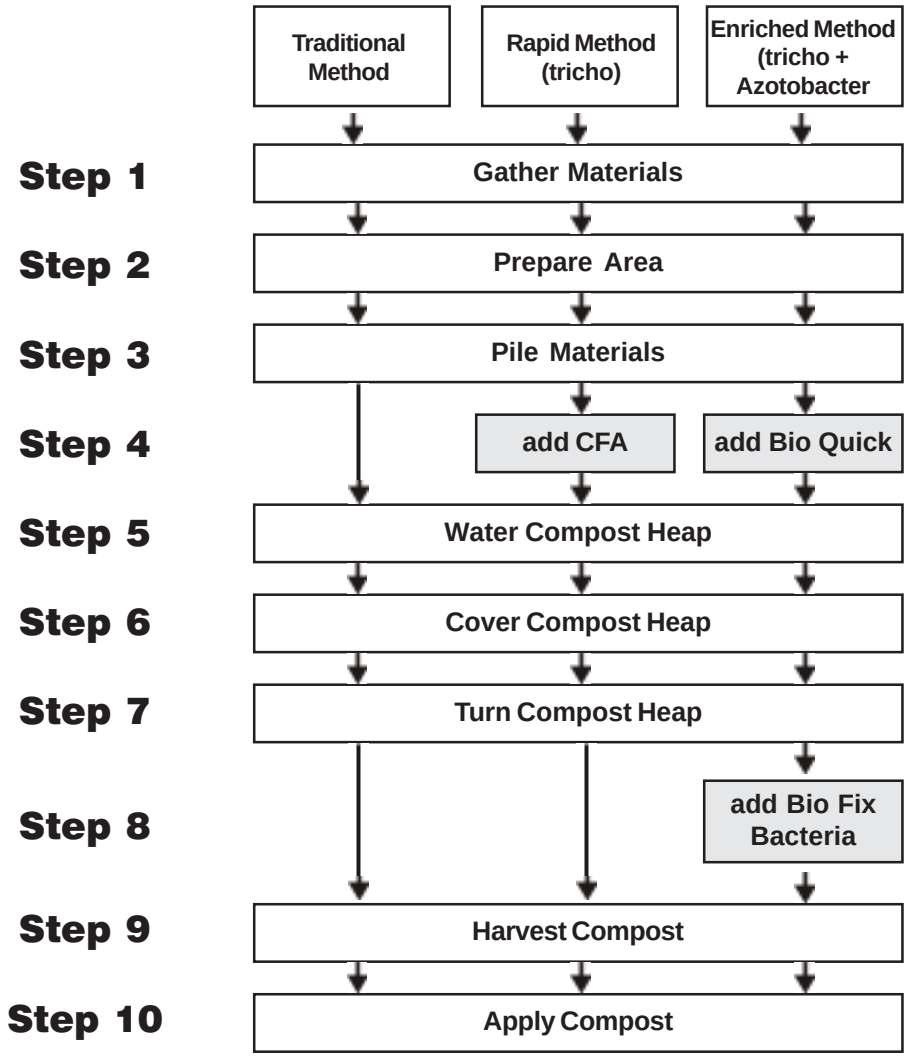
Bio-Enriched Method

Employing both a fungus activator and a nitrogen-fixing bacteria, farm wastes are first decomposed by Trichoderma sp. for 2-3 weeks, after which the resulting compost is inoculated with live N-fixing bacteria Azotobacter sp. Incubation for 1 week produces a nitrogen-enriched compost that can supply a rice crop's total N requirement, depending on the material used, soil condition, and planting season. This involves 10 steps.

NOTE: For the Rapid and Bio-Enriched Methods of composting, procedures in preparing these microorganism activators are available at the Institute of Biological Sciences (IBS) and the National Institute of Molecular Biology and Biotechnology (BIOTECH) of the University of the Philippines Los Baños (UPLB), College, Laguna; and the Department of Science and Technology (DOST).

Simplified guide to compost production

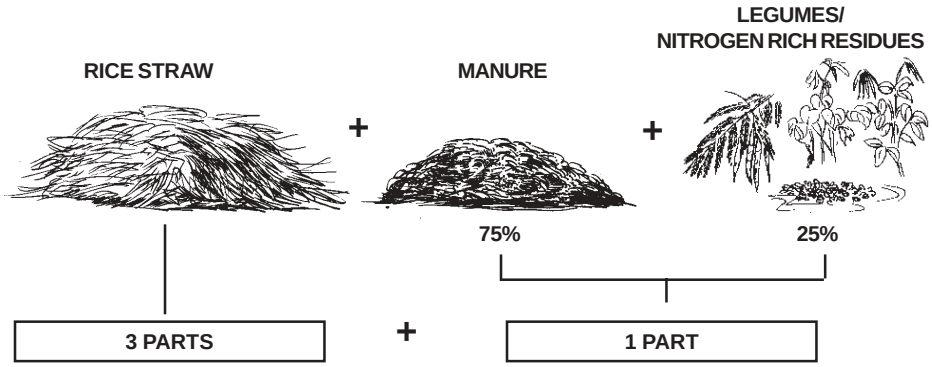
Most of the steps are common to the three methods of composting. Step 4 or the addition of fungus activator, however, does not apply to the traditional method. Step 8 or the addition of bacteria inocula, on the other hand, applies only to the Bio-Enriched method of composting.



Step 1. Gather materials

Gather rice straw, weeds, sugarcane bagasse, corn stalks and stovers, leguminous materials such as ipil-ipil, azolla, sesbania, mungbean, cowpea, soybean crop residues, and animal manure. Soak rice straw for 6-12 hours before piling. Chop materials for easier decomposition.

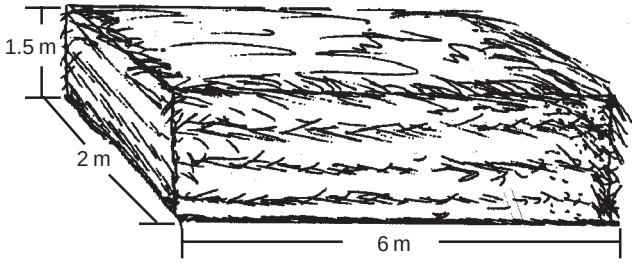
Ideal proportion of composting materials is 3 parts rice straw and 1 part mixture of animal manure and leguminous plant residues. Less than this proportion prolongs the decomposition process.



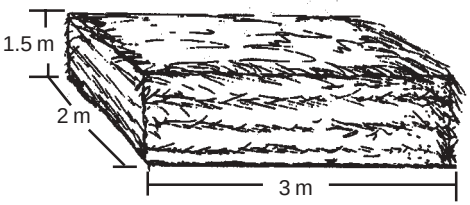
Step 2. Prepare compost area

Choose a shaded and well-drained area.

To compost 5 tons of rice straw, we need a volume of 90 m^3. A plot size of 2m x 6m x 1.5m can acccomodate 1 ton of rice straw. Make 5 plots. If you want smaller plots, a plot size of 2m x 3m x 1.5m can accommodate 500 kg of rice straw materials. Make 10 small plots to be able to compost 5 tons rice straw.



x 5 compost beds



x 10 compost beds

Step 3. Pile materials

Traditional Method

Make six layers of compost materials, each layer about 25 cm thick. A layer of compost material consists of three parts rice straw, one part manure, soil, and ash or lime spread on top of each other.

Stack the layers until the compost heap 1.5 high. Insert several perforated bamboo poles into compost bed to serve as breathers.

Rapid method

(Trichoderma)

To provide aeration at the bottom, construct platfrom or use available materials such as coconut leaf, kakawate, banana trunk, and bamboo.

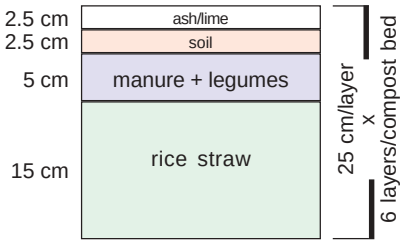
Make six layers of compost materials, each laer about 25 cm thick. a layer of compost material consists of three parts rice straw, one part mixture of animal manure and leuminous materials, annd a thin layer of fungus activator, known as Compost Fungal Activator (CFA). There is no need to put ash/lime or bamboo breathers.

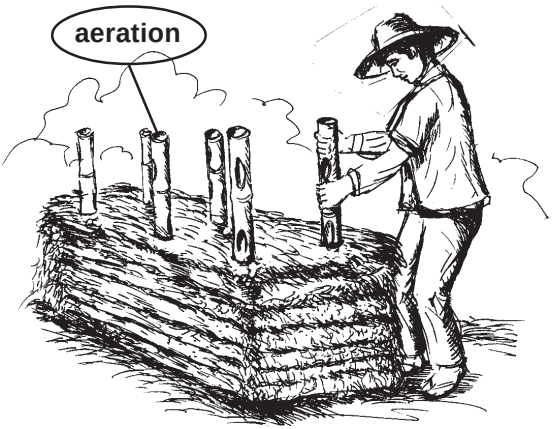
Bio-Enriched Method

(Trichoderma and Azotobacter)

Mix all the rice straw, animal manure, and leguminous materials into 3:1 proportion.

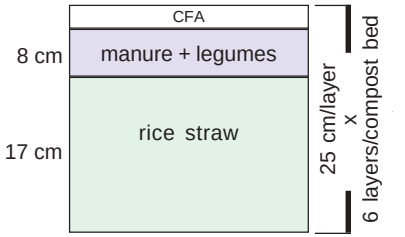
Apply 2.5 kg of the fungus activator, known as BIO-QUICK, for ever ton of composing material. Spread evenly on top of the first layer. Place 2-3 perforated bamboo poles horizontal across the first layer before adding the next layer. Make three layers.

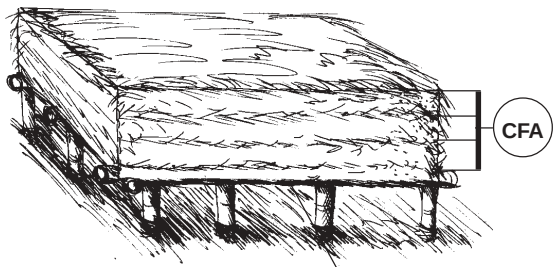


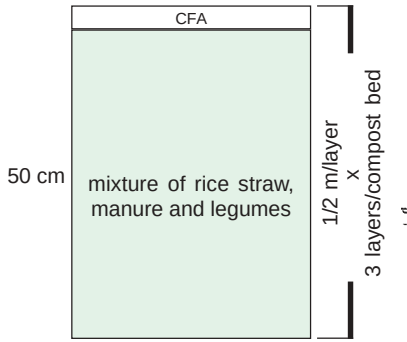


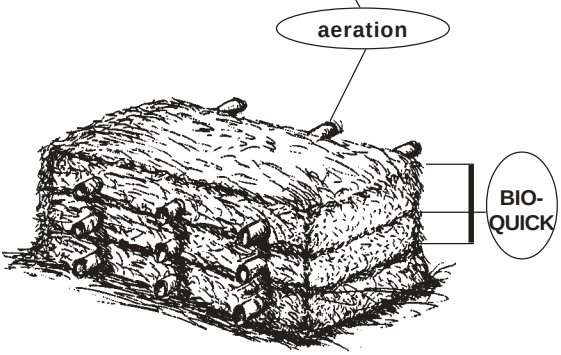
Step 4. Spread fungus activator

Spread evenly 5-10 kg of Trichoderma fungal activator for every ton of composting material.



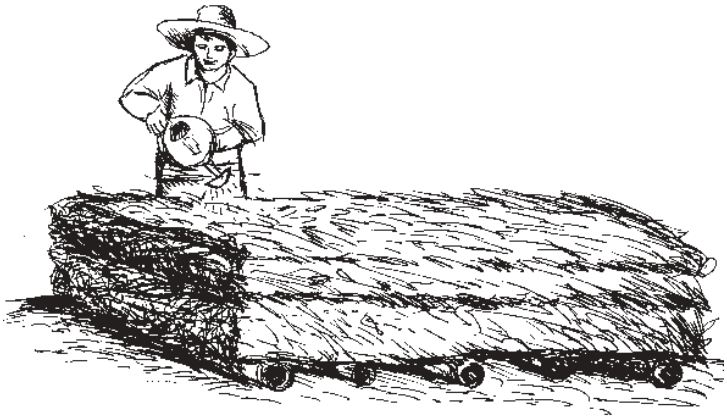






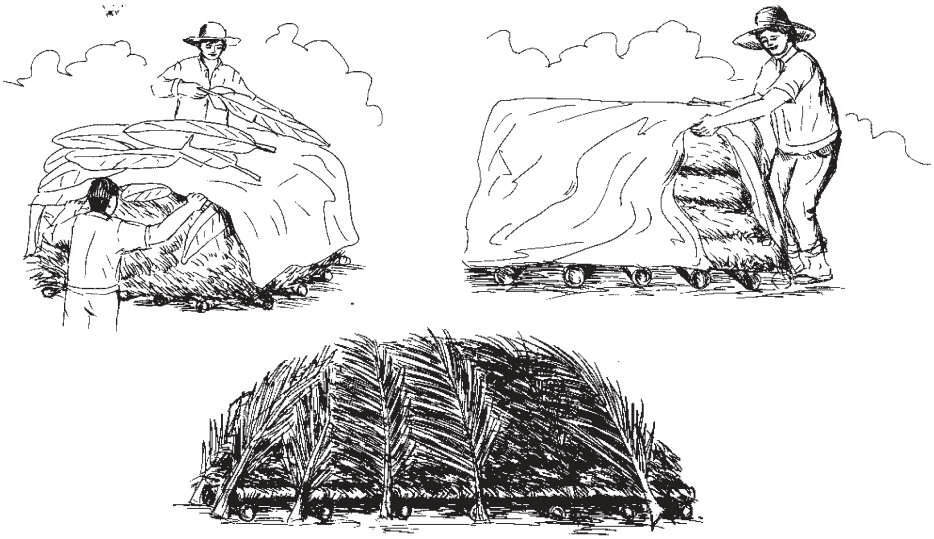
Step 5. Water compost heap

Water each layer of compost heap until it is sufficiently moist.



Step 6. Cover compost heap

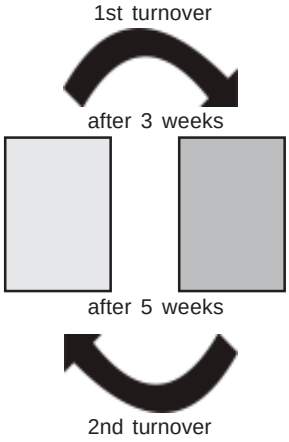
Cover with plastic sheet, used sacks, banana and coconut leaves to increase temperature and prevent too much water into the compost heap which could leach the nutrients.



Step 7. Turn compost heap

Traditional Method

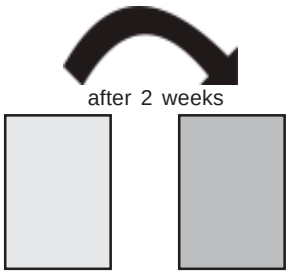
Turn or mix compost heap after 3 weeks, then agein after 5 weeks.

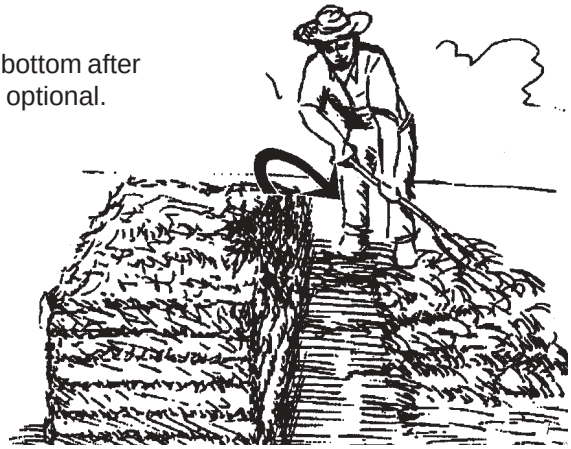


Rapid Method

(Trichoderma)

Turn compost heap from top to bottom after 2 weeks. This step, however, is optional.

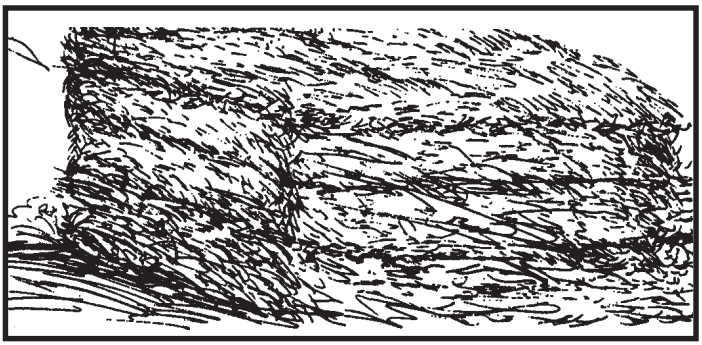


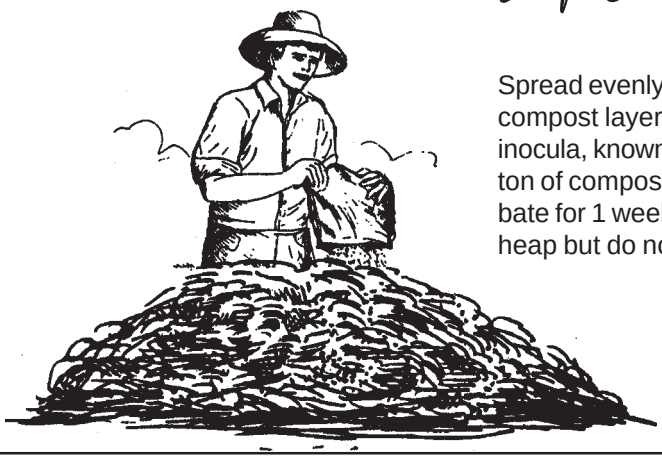


Bio-Enriched Method

(Trichoderma and Azotobacter)

Remove cover after 2-3 weeks or when the compost heap has decomposed. Separate undecomposed materials for further composting.





Step 8. Add bacteria Inoculum

Spread evenly on top of each compost layer 2.5 kg of bacteria inocula, known as BIO-FIX, for every ton of compost material and incubate for 1 week. Cover the compost heap but do not allow to dry.

Step 7. Harvest compost

Traditional Method

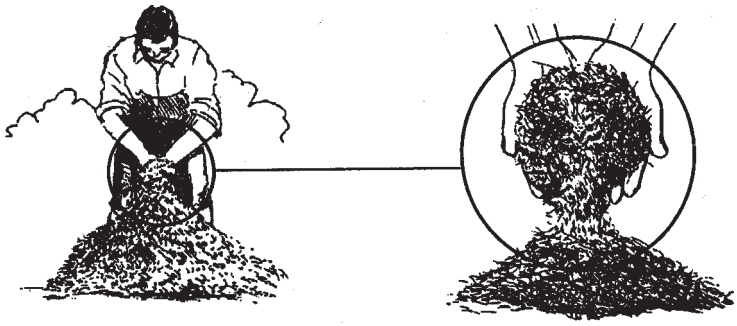
Harvest 4 weeks after the second turnover of the compost heap. The N content of the compost is now 1.5%. Use 2 tons of compost per hectare.

Rapid method *(Trichoderma)*

Harvest 1-2 weeks after turning over the compost heap. The N content of the ripe compost varies from 1.0% - 3.0% depending on the amount of manure and nitrogenous plant materials used as substrates. Use all the compost produced in the field which could be about 2.0 tons per half commercial organic fertilizer produced through the rapid composting method is used, mix 8-10 bags per ha.

Bio-Enriched method *(Trichoderma and Azotobacter)*

After 1 week of incubation of the bacteria inocula, the compost is ready for use. N content of the compost ranges from 1.5% to 3%. You need only to apply 250-500 kg or 5-10 bags compost per hectare. Presence of live N-fixing bacteria in the compost will boost total N in the soil.

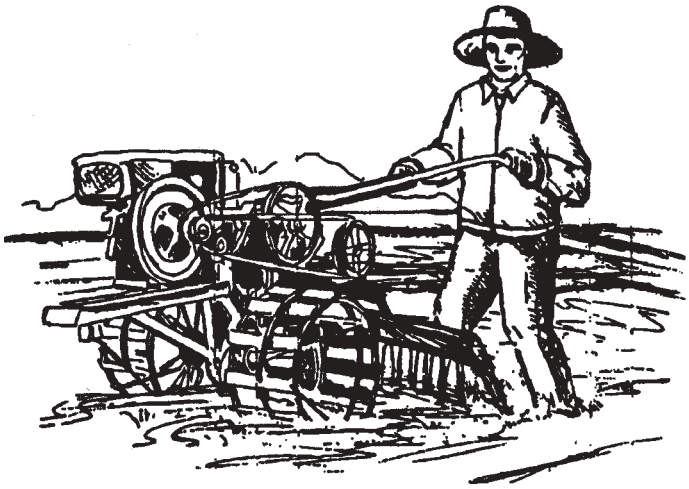


There are current 36 Mass production Centers (MPC) for fungal activators and 17 Compost Production centers (CPC) accredited by the Department of Science and Technology (DOST) to make these activators available to farmers. These centers include government, nongovernment organizations, and cooperatives. There are 15 similar agencies producing both fungal activators and ready-to-use compost (see Annex 3).

BIOTECH and IBS also provide training for cooperatives and entrepreneurs who wish to go into commercial organic fertilizer and mass production of these microorganisms.

Step 7. Apply compost

Broadcast compost as basal fertilizer before final harrowing during land preparation.



Health precautions

1. The decomposing compost heap can generate heat up to 60° celsius. Be careful in handling the compost while turning. Wear protective gloves or foot gear so as not to scald your hands and feet.

2. Composting materials and microorganisms may cause allergies, although they are nonpathogenic. To avoid inconvenience from itching, cover nose and mouth with mask; use long-sleeved clothes, and wash body and hands after working on the compost.

Acknowledgment

Dr. Virginia C. Cuevas of the Institute of Biological Sciences (IBS), University of the Philippines Los Baños (UPLB), for developing the Compost Fungal Activator (CFA) technology.

Dr. Bayani Espiritu of the National Institute of Molecular Biology and Biotechnology (BIOTECH), University of the Philippines Los Baños (UPLB), for developing the BIO-ENRICHED compost technology, employing the use of a fungal activator BIO-QUICK and an N-fixing bacteria inocula, BIO-FIX.

Fertilizer and Pesticide Authority, Department of Agriculture.

This bulletin was prepared at the Philippine Rice Research Institute (PhilRice) by Dr. Teodula M. Corton, subject matter specialist, Mr. Paterno Rebuelta, soils specialist, and Dr. Santiago R. Obien, technical adviser; technology synthesis and visualization by Roger F. Barroga; illustrations by Carlito Bibal; and layout by Carlo Dacumos.

References

Bureau of Soils and Water Management. 1994. Tricho for faster composting. Diliman, Quezon City.

Cuevas, V.C. 1988. Make Your Own Compost. Techguide series no. 11. UPLB. TLRC. National Book store. Manila.

____. 1991. Rapid Composting for Intensive Ricelandn Use. Innovations for Rural Development. 1(1):5-10. SEARCA-SEAMEO.

____. 1991. Rapid composting of rice straws in irrigated paddies. IBS, UPLB, College, Laguna.

____. 1993. Rapid composting fits rice farmers. ILEIA Newsletter. v 9 no 2:11-12.

____SN. Samulde and P.G. Pajaro. 1988. Trichoderma harzianum Rifai as Activator for Rapid Composting of Agricultural Wastes. The Phil. Agric. 71:(4)461-469.

Espiritu, B. 1992. Bio-organic fertilizers (BOF): enhancing the value of farm wastes through microbial inoculation. Discussion paper presented at the STARRDEC 1992 R&D Regional Symposium and Planning Workshop, May 21-22. Don Severino Agricultural College, Indang, Cavite.

____.1994. Bio-organic fertilizers: quality enhancement of organic fertilizers through composting and inoculation with nitrogen-fixing bacteria. Paper presented in the Investor's Forum, PTTC.

____. 1996. Use of processed inoculated composts in rice production. Paper presented at the 2nd PhilRice-IRRI-UPLB Tripartite Workplan Meeting. IPB, College, Laguna.

____. Undated. Biotechnological aspects for upgrading of organic fertilizers. Unpublished paper.

____. et al. Undated. Bio-organic fertilizer processing. Unpublished paper.

____ and M. Tamo. 1993. Maramihang paggawa ng bio-organikong pataba. BIOTECH, UPLB, College, Laguna.

Fertilizer and Pesticide Authority. Undated. Organic fertilizers: production and use. Agricultural Information Division, Department of Agriculture, Diliman, Quezon City.

Obien, S. et al. 1995. Recent trends in researches on organic fertilizer use in paddy rice. Paper presented at the National Symposium/Workshop on Organic Fertilizer Use in Paddy Rice, Feb. 29 - Mar. 1. PhilRice, Muñoz, Nueva Ecija.

PCARRD. 1994. Establishment of a compost production unit. PCARRD Information Bulletin No. 43, Los Baños, Laguna.

ANNEX 1

Nutrient content of farm residues and animal manure

Average elemental NPK composition of some crop residues, green and animal manures as compost materials (Misra and Hesse, 1983 as cited by Cosico 1985).

Material	C/N	% OVEN DRY BASIS N	P	K
Rice Straw	105	0.58	0.10	1.38
Wheat straw	105	0.49	0.11	1.06
Corn stover	55	0.59	0.31	1.31
Soybean stover	32	1.3	–	–
Cotton stalk & leaf	–	0.88	0.15	1.45
Peanut straw	19	0.59	–	–
Peanut hull	–	1.75	0.20	1.24
Cowpea stem	–	1.07	1.14	2.54
Sugarcane trash	116	0.35	0.04	0.50
Cabbage	12	3.6	–	–
Tobacco	13	3.0	–	–
Green Manure				
Sesbania aculeata	–	2.18	–	–
Sesbania speciosa	18	2.51	–	–
Vigna sinensis (Cowpea)	–	3.09	–	–
Melitotus indica	–	3.36	0.22	1.27
Pisum sativum (pea)	–	1.97	–	–
Acacia ferruginea leaf	–	2.96	0.13	0.88
Acacia arabica leaf	–	2.61	0.17	1.20
Desmodium trifolium	–	2.93	0.14	1.30
Calopogonium mucunoides	–	3.02	–	–
Water hyacinth	18	2.04	0.37	3.40
Azolla	–	3.68	0.20	0.15
Algae	–	2.47	0.12	0.37
Animal Manure				
Cattle	19	1.50	1.00	0.94
Sheep	29	2.02	1.75	1.94
Horse	24	1.59	1.65	0.65
Pig	13	2.81	1.61	1.52
Chicken	–	4.00	1.98	2.32
Duck	–	2.15	1.13	1.15
Human	8	7.24	1.72	2.41

ANNEX 2

List of CFA manufacturers (as of April 1996)

Mass Production Center (MPC)
(compost fungal activator)

DOST-CAR

DOST-CAR (GO)
La Trinidad, Benguet
Ms. Zenaida Baucas

ASIST (SCU)
Langangilang, Abra
Susan Edwin

PSTC (GO)
Bulanao, Tabuk
Kalinga
Florentino Layugan

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Cabanatuan City

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Talipan, Quezon

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Bolbok, Batangas (GO)

QAES, Tiaong (SCU)

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ATTB-Albay (Coop.)
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Cebu Provincial Lab. (GO)
Capitol, Cebu City

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Foundation University Laboratory (SCU)
Dumaguete City
Bohol Agricultural Promotion Center Laboratory (GO)
Tagbilaran City

REGION VIII

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Bontoc, Southern Leyte
Ms. Jocelyn Sibuya

DOST 8 (GO)
Tacloban City

SNAS-MPC (SCU)
Samar National Agricultural School
San Jorgem, Samar

Southern Samar Agricultural College (SSAC) (SCU)
Salcedo, E. Samar

REGION X

Trento Mun. Gov't (GO)
Trento, Agusan del Sur

DA Camiguin (GO)
Mambajao, Camiguin

DA Regional Soils Testing Laboratory (GO)
Capitol Compound
Cag. de Oro City

DOST X - RPCC (GO)
Carmen, Cagayan de Oro

DA Tangub (GO)
City Agricultural Office
Tangub City,
Misamis Occidental

DA-Oroquieta (GO)
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Oroquieta City,
Misamis Occidental

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LGU - Surallah
Surallah Integrated Agricultural Lab.
Surallah, S. Cotabato

LGU-Davao del Sur
Provincial DA compound
Digos, Davao del Sur

LGU-Tagum Prov'l DA Cpd.
Mankilan, Tagum, Davao

LGU - Nabunturan
Davao

LGU - Koronadal
South Cotabato

LGU - Gen. Santos City

LGU - Banganga
Davao Oriental

LGU - Compostela
Davao

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Colombio, Sultan Kudarat
Engr. Amante del Muro

Notre Dame of Salaman College (SCU)
Lebak, Sultan Kudarat
Mr. Rey Cadiz

DA RIARS (GO)
Kidapawan, Cotabato
Ms. Linda Velasco

City Veterinary Service Office (LGU)
Pansacala, Cotabato City

LGU - BALOI
Boloi, Lanao del Norte
Engr. Mohammad Rasul

MSU - IIT
Iligan City
Dr. Guillermo Guevarra

Lingap
Rosary Heights
Cotabato City
Mr. Michael Tan

Compost Production Unit (CPU)
(ready-to-apply compost)

DOST-CAR

Swamp Waste Mgt. Center (SCU)
BSU, La Trinidad, Benguet

REGION 1

Sta. Catalina MPCI (Coop.)
Sta. Catalina, Ilocos Sur
Mr. Luciano Ragasa

Western Pangasinan Federation
Alaminos, Pangasinan (Coop.)
Mr. Claudio Ofrancio

Estanza Social Credit Association Inc. (Coop.)
Estanza, Bolinao, Pangasinan
Mr. Loreto Balawat

Sibol Enterprises (P.E.)
Lingayen, Pangasinan
Engr. Reynaldo Sison

REGION II

Baggao Planners Assembly (Coop.)
San Jose, Baggao, Cagayan

Orgafer Center (P.E.)
Aurora East
Diffun, Quirino
Mr. Alex Panilagao

REGION III

MAG-IMPOC MPCI
Magsaysay, Guagua, Pampanga (Coop.)

West Grow MPCI (Coop.)
TCA Compound, Camiling, Tarlac

REGION IV

SUSI Foundation (NGO)
Tiaong, Quezon

SLPC (SCU)
Lucban, Quezon

SABATAMPCI (GO)
Magdalena, Laguna

Magdiwang Beneficiaries
Romblon, Sibuyan (Coop.)

SABADECO (Coop.)
San Jose, Mindoro

SLPC (SCU)
Siniloan, Laguna

REGION V

MVM Bio-organizer, (P.E.)
Palestina, Pili, Camarines Sur

MACRO Bio-organic (P.E.)
Pili, Camarines Sur

REGION VII

San Isidro MPCI (Coop.) (SIMPCI)
Pilar, Bohol

Bohol Agricultural College (BAC)
Bilar, Bohol (SCU)

REGION XI

Escobillo Family (P.E.)
Brgy. Maltana
Tampahan, S. Cotabato

KINFACI (Coop.)
South Cotabato

Solon Family (P.E.)
Brgy. Cebuano
Tupi, S. Cotabato

Huelar Family (P.E.)
Brgy. Lower Sulit
Polomolok, S. Cotabato

REGION XII

Mindanao Seaweed Ventures (P.E.)
Kidapawan, S. Cotabato
Mr. Jose Riga

Kalikasan Service Inc.
Cotabato City (NGO)
Fr. Colin Bagaforo

Farmers Grow Organic Fertilizer Plant (P.E.)
Tacurong, South Cotabato

UNLAD ANI, INC.
Brgy. Glamarog (P.E.)
Polomolok, South Cotabato

MPC - CPU

REGION I

City of Agriculture (GO)
Laoag City
Mrs. Marilyn Martin

Pangasinan State University, Sta. Maria, Pangasinan (SCU)
Dr. Leonardo Monje

AGTALON (NGO)
Nalsian, Manaoag, Pangasinan
Mr. Hilario Padilla

REGION II

Palayag MPCI (Coop.)
Amulung, Cagayan
Mrs. Aurora Malamug

Nagkarsuan MPCI (Coop.)
Sanchez Mira, Cagayan
Mr. Elmer Bagasol

REGION III

Greater Bani MPCI (Coop.)

AWARE, Inc. (P.E.)
Sta. Maria, Bulacan

Peoples Economic Council (NGO)
Nueva Ecija Portal PMKB (Coop.), Rizal,
Nueva Ecija

REGION IV

DA - SLBIP (Coop.)
Tanza, Cavite

REGION V

Pilipinas Shell (P.E.) Foundation
Bonbon, Camarines Sur

Pensumil (P.E.)
Pili, Camarines Sur

REGION VI

Ma. Cristina Farms (P.E.)
Balantang, Jaro

REGION VIII

LIPATA MPCI (Coop.)
Lipata, Alen

REGION X

LADAMA MCI (Coop.)
Los Angeles, Butuan City

REGION X

BUSCO Organic (P.E.) Fertilizer Plant
Quezon, Bukidnon

Ozamis Agricultural Development Inc. (OADI)
Maramag, Bukidnon (NGO)

Kalilangan Irrigators Service Coop., Inc. (KISCI)
Kalilalngan, Bukidnon

Dagumbaan Organic Fertilizer (NGO)
Dagubaan, Maramag, Bukidnon

Mabao Organic (P.E.) Fertilizer Plant
Jocel's Enterprise
Valencia, Bukidnon

Cahansa Family Ent.
Manticao, (P.E.)
Misamis Oriental

DA - Oroquieta (GO)
Oroquieta City

Servus Human Resource Dev't Program (SERHDEP)
Initao, (NGO)
Misamis Oriental

REGION XI

NECOFARBIA (Coop.)
New Corella, Davao
SURSIMCO (Coop.)
Tago, Surigao del Sur

Tinguha Fouondation Bo. 2 & 6 Koronadal
South Cotabato

SRDF (NGO)
Binugao, Toril, Davao City

SPDA (GO)
Catalunan, Paqueño, Davao City

TRRC (P.E.)
Madaum, Tagum, Davao City

SODACO (P.E.)
Catalunan, Pequeño, Davao City

REGION XII

NAKAN (Coop.)
Bagumbayan, S.K.
Mr. Lester Granada

Kapatagan MPCI (Coop.)
Mr. Frank Bihod

A. Abad (P.E.)
UPI, Maguindanao
Mr. Artaban Abad

ANNEX 3

FPA-approved fertilizers

(Fullly registered products as of March 31, 1996)

Company	Common Name
ORGANIC	
AMALIA FARMS, INC.	GREEN HARVEST ORG. FERTILIZER
IGP FARM CORPORATION	HI-GRO TECH ORGANIC FERTILIZER
MANILA FERTILIZER, INC.	MANILA ORGANIC
SAGANA 100 PHILIPPINES, INC.	SAGANA 100 ORGANIC FERTILIZER
SANDERS ORGANIC FERTILIZING MANUFACTURING	SANDERS ORGANIC FERTILIZER
TADEJA ENTERPRISES	FARMERS PRODUCT ORGANIC
INORGANIC	
ALDIZ, INC.	CROP GIANT 19-19-19 CROP GIANT 15-15-30
ALTRADE, INC.	GROWMAX FOLIAR FERT. 21-21-21 GROWMAX FOLIAR FERRT. 6-32-35
BIOSTAT MARKETING	WOKOZIM FOLIAR FERTILIZER
BMJ AGRI-SAVER INDUSTRIES	AGRI-SAVER LIQUID FERTILIZER
CYANAMID AGRIC'L PROD., INC.	WOKOZIM FOLIAR FERTILIZER
DATINGBAYAN AGRO INDUSTRIAL	ALGAFER LPF PLUS
GENETIX, INC.	GREEN BEE LIQUID FERTILIZER
GREEN BELT FERTILIZER	GREEN BELT LIQUID FERTILIZER
HOECHST PHILIPPINES, INC.	BLAUKORN COMPLESAL 5-8-1C
MOBILE MERCHANTILE & DEVELOPMENT CORP.	MATROL FOLIAR FRT. 14-12-14-1 HORTAI FOLIAR FERTILIZER
SOUTHERN AGRO EXPORT CORP.	GROW MORE CROPS 20-20-20 GROW MORE CROPS 20-5-30
SOIL AMEND/CONDITIONER	
BMJ AGRI-SAVER INDUSTRIES	AGRI-SAVER FERTILIZER SOIL CONDITIONER
CUDANIN FERTILIZER TRADING	AGRIPHOS GUANO PHOSPHATE FERT.
MANCHEM INDUSTRIES, INC.	BIOZOME SOIL CONDITIONER
TILLERMATE ENTERPRISES	COMPLIT Zn (CHELATE) METALATE

ANNEX 4

Companies/Cooperatives marketing bio-organic fertilizers

COMPANY/COOPERATIVE	CONTACT PERSON	ADDRESS	OTHER INFO
JMSS Microbials Enterprises	Dr. Bob Santos	Nursery Road, Lagao Gen. Santos City	capacity: 8,000 bags/wk also produces inocula
INFARMCO	Mr. Nick Chavez	San Isidro Caguyao, Laguna	capacity: 24,000 bags/yr. also produces inoculaa
Koronadal Integrated Farmers Cooperative	Dr. Isagani Cathedral	Samahang Nayon Bldg. Koronadal, South Cotabato	
NOVATECH Agri-food	Dr. Ronaldo Sumaoang	Rm. 409 Web-Jet Bldg. No. 64 Quezon Ave. cor. BMA Ave. Quezon City	source of inocula: BIOTECH also produces inocula capacity: 12,000 bags/yr. plant site: Camiling, Tarlac
Gratia Plena	Mr. Ross Quin	Mabini Townhouse Mabini St., Muñoz, Nueva Ecija	source of inocula: BIOTECH
Kaunlaran Bio-organic Fertilizer Enterprises	Mr. Oscar Ortañez	National Highway Brgy. Labuin, Sta. Cruz Laguna	capacity: 5,000 bags/yr. plant site: Victoria, Laguna
EDNAC Enterprises	Mr. Editor Nacpil	46 5th Street Parañaque, Metro Manila	plant site: San Fernando, Pampanga

COMPANY/COOPERATIVE	CONTACT PERSON	ADDRESS	OTHER INFO
Rice Pro Mfg. Co.	Mr. Henry Young	Sitio Hermosa, Brgy. Malaruhatan, Lian, Batangas	source of inocula: BIOTECH
Envirophyl, Inc.	Mr. Gil Aller	760 Lopez Ave. Los Baños, Laguna	capacity: 15,000 bags/yr source of inocula: BIOTECH plant site: Balayan, Batangas
VMC Farmers' Cooperative, Inc.	Mr. Nemesio dela Cruz	Fidelity Motors C. Blg. 24 Lacson St., Bacolod	capacity: 60,000 bags/yr also produce inocula
Bio-manna Agri-business Inc.	Mr. Johnny Ortega	Brgy. Luntal	capacity: 5,000 bags/yr.
Parents and Youth of Gamu (PAYOGA)	Ms. Gina Ruiz	1st District Gamu, Isabela	source of inocula: BIOTECH
St. Michael's	Mr. Herminio Ayo	Pamplona, Camarines Sur	
Maximum Vigor Mfg.	Mr. Vic Machado	Palestina, Pili, Camarines Sur	source of inocula: BIOTECH
Pilipinas Shell Foundation, Inc.	Mr. Efren Bautista	Shell Training Farm Bombon, Naga City	also produces inocula
Bagong Flores Multi-purpose Cooperative	Ms. Virginia Siriban	Lupao, Nueva Ecija	
Bulacan Garden	Ms. Fe Amaro	Quezon City	

COMPANY/COOPERATIVE	CONTACT PERSON	ADDRESS	OTHER INFO
Phela Resources	Mr. Alex Pascual	Gen. Santos City	
ACDC Foundation	Mr. Romeo Consumo	Lower Katungal 9800 Tacurong, Sultan Kudarat	
Barangay Scholars' Multi-purpose Cooperative, Inc.	Mr. Bernabe Llorente	Gen. Trias, Cavite	
Agtalon	Mr. Gil Padilla	Nalsian, Manaoag, Pangasinan	
KABAN Group, Inc.	Mr. Manuel Agala	c/o Mr. Rey Hernandez No.30 Villatierra Sumapang Matanda Malolos, Bulacan	

PhilRice

On November 5, 1985, then president Ferdinand E. Marcos signed Executive Order No. 1061 creating the Philippine Rice Research Institute or PhilRice. His successor, former president Corazon C. Aquino reaffirmed this order on November 7, 1986 through Executive Order No. 60, which broadened and strengthened the mandate of PhilRice. Full operations began in 1987 in the University of the Philippines at Los Baños, Laguna.

To strengthen its institutional capability, PhilRice in 1988 sought assistance from the Japanese government for a grant to build its central experiment station in Maligaya, Muñoz, Nueva Ecija. Through the Japan International Cooperation Agency (JICA), a fully-equipped research complex was built and turned over to the Philippines in March 1991. These facilities were inaugurated in May 1991.

Today, PhilRice coordinates and unifies the research and developmetn activities of more than 60 agencies working on rice nationwide. This includes experiment stations of the Department of Agriculture and state colleges adn universities, strategically located in the country. PhilRice's research programs cover rice varietal improvement, planting and fertilizer management, integrated pest management, rice-based farming systems, rice engineering and mechanization, rice chemistry and food science, social science and policy research, and technology transfer. PhilRice is attached to the Department of Agriculture (DA).

for more information, write, visit or call

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PhilRice San Mateo
San Mateo, 3318 Isabela
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PhilRice Midsayap
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8611 Agusan del Norte

Department of Agriculture
PhilRice