ORGANIC MILLED RICE - CODE OF PRACTICE - POSTPRODUCTION

PNS/BAFS 42:2019

EXPLANATORY MANUAL

DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURE AND FISHERIES STANDARDS

Explanatory Manual

Organic Milled Rice - Code of Practice - Postproduction (PNS/BAFS 42:2019)

Bureau of Agriculture and Fisheries Standards (BAFS)
Quezon City, 2023

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Introductory Note

The Philippine National Standard (PNS) 42:2019 for the Organic Milled Rice – Code of Practice – Postproduction was developed by the Department of Agriculture – Bureau of Agriculture and Fisheries Standards (BAFS) together with the Technical Working Group (TWG) consists of experts from other government agencies and independent practitioners. The standard aims to establish a system within organic agriculture mainly for postproduction operations of organic milled rice, *Oryza sativa* L.

This year, the Bureau developed the accompanying document, an Explanatory Manual, together with a newly established TWG. Through the EM, the Bureau aims to promote common understanding and harmonize the interpretation of the standard and its requirements. In the EM, the meaning of the standard is explained through images and explanatory notes. The explanation elaborates on the rationale behind the requirements but does not cover or provide information specific to a regulatory requirement.

For more information, please visit our website at www.bafs.da.gov.ph and our Facebook page at www.facebook.com/da.bafs.

Director's Message

Following the Organic Agriculture Act of 2010, the BAFS embarked on developing Philippine National Standards (PNS) relevant to organic agriculture. One of which is the PNS for Organic Milled Rice - Code of Practice - Postproduction (PNS/BAFS 42:2019).

The Standard presents the recommended organic agriculture practices mainly for post-production operations of organic milled rice from harvesting up to storage practices.

This Explanatory Manual was developed, not just to promote the Standard, but also to allow its readers to better understand the provisions of the standards through the notes indicated and photos/images added.

Hopefully, the readers, especially our farmers, can now safely say, 'Don't panic; it's organic!'.

KAREN KRISTINE A. ROSCOM, PhD
Director IV

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Sections 1 & 2

Scope and Normative references

1 Scope

This standard establishes a system within organic agriculture mainly for postproduction operations of organic milled rice, *Oryza sativa* L.

2 Normative references

The following documents are referred to in the text in such a way that some of all of their content constitutes the requirements of this document. For dated references, only the edition cited applied. For undated references, the latest edition of the referenced document (including any amendments) applies.

PNS/BAFS 290:2019, *Grains - Grading and classification - Paddy and milled rice*

Section 3

Terms and definitions

Explanatory notes on the provisions of the standards are found inside the yellow boxes. Additional information are presented as notes and/or images. Section numbers of the manual mirrors the content of the PNS.

3 Terms and Definitions

For the purposes of this document, the following terms and definitions apply.

Paddy rice
rough rice
palay
unhulled rice grain with the glumes enclosing the kernel

Brown rice
pinawa
rice grain with its hulls removed but not polished, regardless if pigmented or not

Organic milled rice
milled rice obtained from organically grown and processed rice

Milled rice
bigas
kernels obtained after removal of the hull, aleurone layers (bran, pericarp, testa), and germ

Postproduction
series of activities that grain crops undergo which include harvesting, threshing, hauling, drying, milling, handling, packaging, and storage

Harvesting

process of collecting the mature rice crop from the field. Paddy harvesting activities include reaping, stacking, handling, threshing, cleaning, and hauling. These can be done individually or a combine harvester can be used to perform the operations simultaneously

Image 1. **Combine harvester can used for harvesting paddy rice.**

Threshing

process of removing the paddy grains from the panicles

Postharvest
series of activities starting from grain drying, milling, storage

Drying

process of removing excess available water from the grain through evaporation by the application of heat

Image 2. **Recirculating Dryer can be used for drying paddy rice.**

Image 3. **Flatbed Dryer can be used for drying.**

Image 4. **Solar drying is the simplest grain drying.**

Rice milling

process of removing of hull only, or of hull aleurone layers (bran, pericarp, and testa), and germ to obtain kernels

Explanatory note:

It is also a process of removing of hull and bran of the paddy to produce milled rice and consists mainly of dehulling and polishing (DA-BAFS, 2020).

Source: R. Gomez

Image 5. **Rice mill is used for milling paddy rice.**

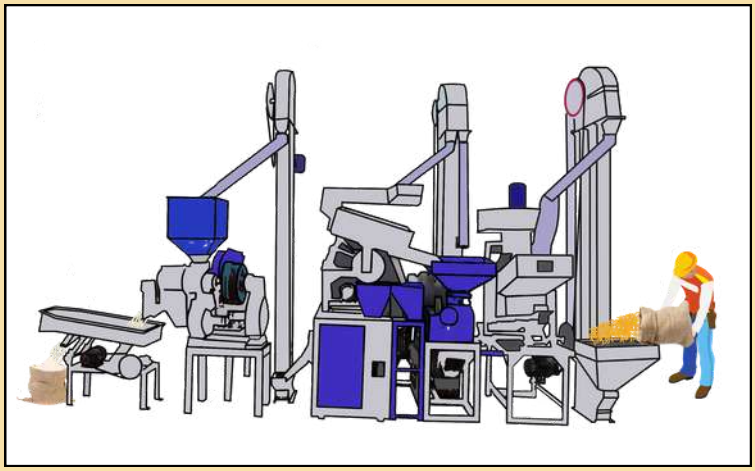

Image 6. **Rice milling using a multi-stage rice mill**

Dehulling

removing the hull from paddy rice, in order to get brown rice

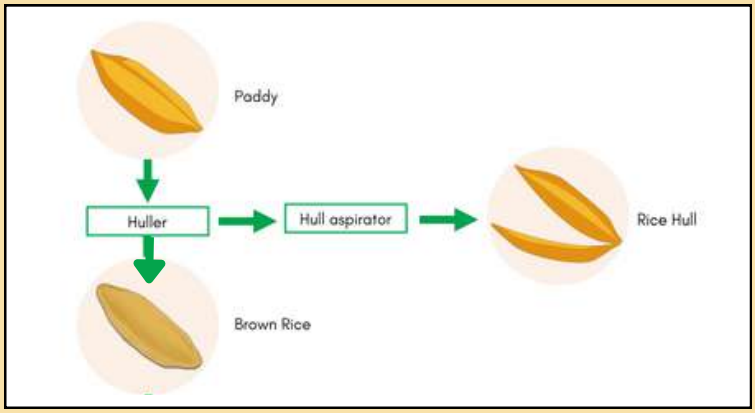

Image 7. **An illustration of how paddy rice is dehulled**

Polishing

whitening
removing the aleurone layers (bran, pericarp, testa) and germ from the brown rice to obtain milled rice

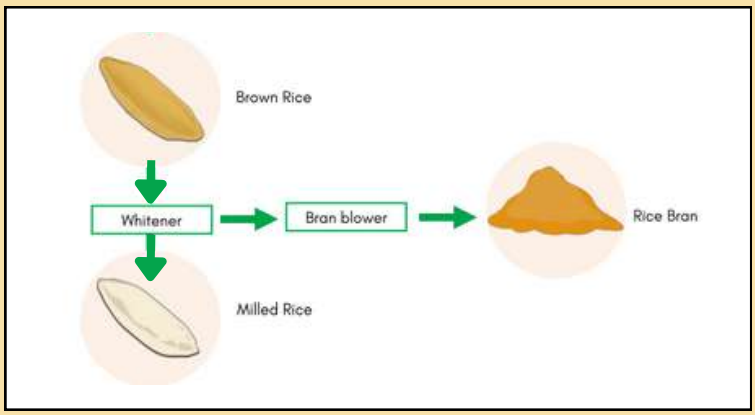

Image 8. **An illustration of how dehulled rice is polished**

Storage

warehousing
keeping organic milled rice in a designated area to preserve its quality until the time of disposition

Image 9. **A warehouse is used for storing rice grains.**

Section 4

Minimum Requirements

Explanatory notes on the provisions of the standards are found inside the yellow boxes. Additional information are presented as notes and/or images. Section numbers of the manual mirrors the content of the PNS.

Hygiene and sanitation shall be strictly observed and maintained at all times.

4.1 Harvesting

There should be no sources of contamination that shall affect the quality of organic milled rice.

Explanatory Note:

Possible sources of contamination include synthetic fertilizers and pesticides, and equipment used for conventional crops/products.

Image 10. **Chemical spray drift from adjacent conventional farms may cause contamination.**

Image 11. **Equipment, such as a combine harvester, can cause contamination when purging or flushing is not done.**

4.1.1 Harvesting of organically grown paddy rice shall not coincide with the harvesting of conventionally grown paddy rice adjacent to the farm. Paddy rice harvested iin the designated buffer zones should be considered non-organic.

Explanatory Note:

Image 12. **A buffer zone (road and banana trees) is located between organic (right side) and conventional (left side) farms.**

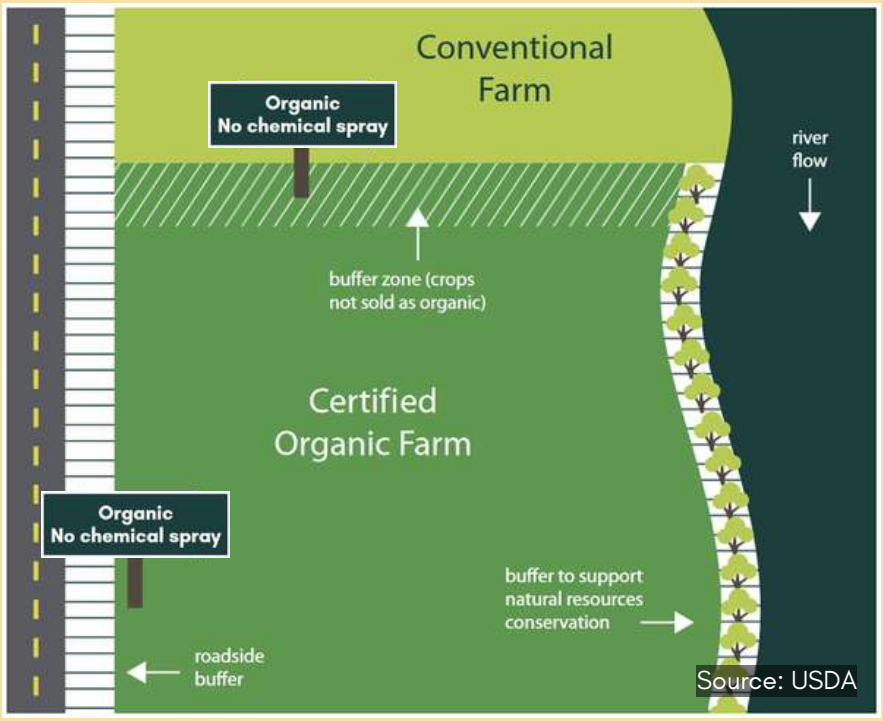

Image 13. **A sample farm layout of a certified organic farm showing an adjacent conventional farm**

4.1.2 Harvesting shall be done when 80% to 85% of the paddy rice grains are mature for shattering varieties. For non-shattering varieties, ripening can be extended up to 90%.

Explanatory Note:

Paddy rice is harvested only after the grain has reached physiological maturity. Mature paddy rice has moisture content between 22-28%. This is also characterized by panicles bending with their own weight, presence of yellowed hulls, and full grains that are neither too ripe (cracked) nor too green.

It is important to harvest paddy rice at the appropriate degree of maturity with moisture content of the grain within an acceptable level.

Premature harvesting of paddy rice keeps the grain from reaching maturity and remains with higher moisture content. This can cause serious losses in the quality of the product due to molds, insects and germination,

On the other hand, if the paddy rice remains longer in the field, it results to a lower moisture content that can cause paddy rice grains to fall, and panicles to shatter at the time of cutting, leading to serious product losses (de Lucia and Assennato, 1994).

Image 14. **Sample photo of paddy rice grains ready for harvest**

4.1.3 Threshers and other accessories should be thoroughly cleaned before threshing. If the equipment is not exclusively used for organic paddy rice, purging or flushing should be practiced. The amount of the purged or flushed paddy rice to be segregated depends on the capacity of the thresher. Segregated paddy rice from the thresher shall be considered as conventional.

Explanatory Note:

If the same equipment is used to harvest both organic and conventional rice crops, there is a possibility of commingling or combining organic products with conventional products. Several precautionary steps can help in preventing commingling (Coleman, 2012; WSDA, 2019).

- Cleanout (purging/flushing) procedures. Established and documented procedures that include logs or records of cleanout dates help ensure that product mixing does not occur.
- Purging of harvesting equipment. Adequate records indicating the quantity of product used for purging and how these are disposed of are helpful to establish the time of separation in processing conventional and organic paddy rice.
- Purging/flushing is done by harvesting at least 1 to 2 bags of organic paddy rice. These bags shall be segregated, documented, and sold as inorganic or conventional products.

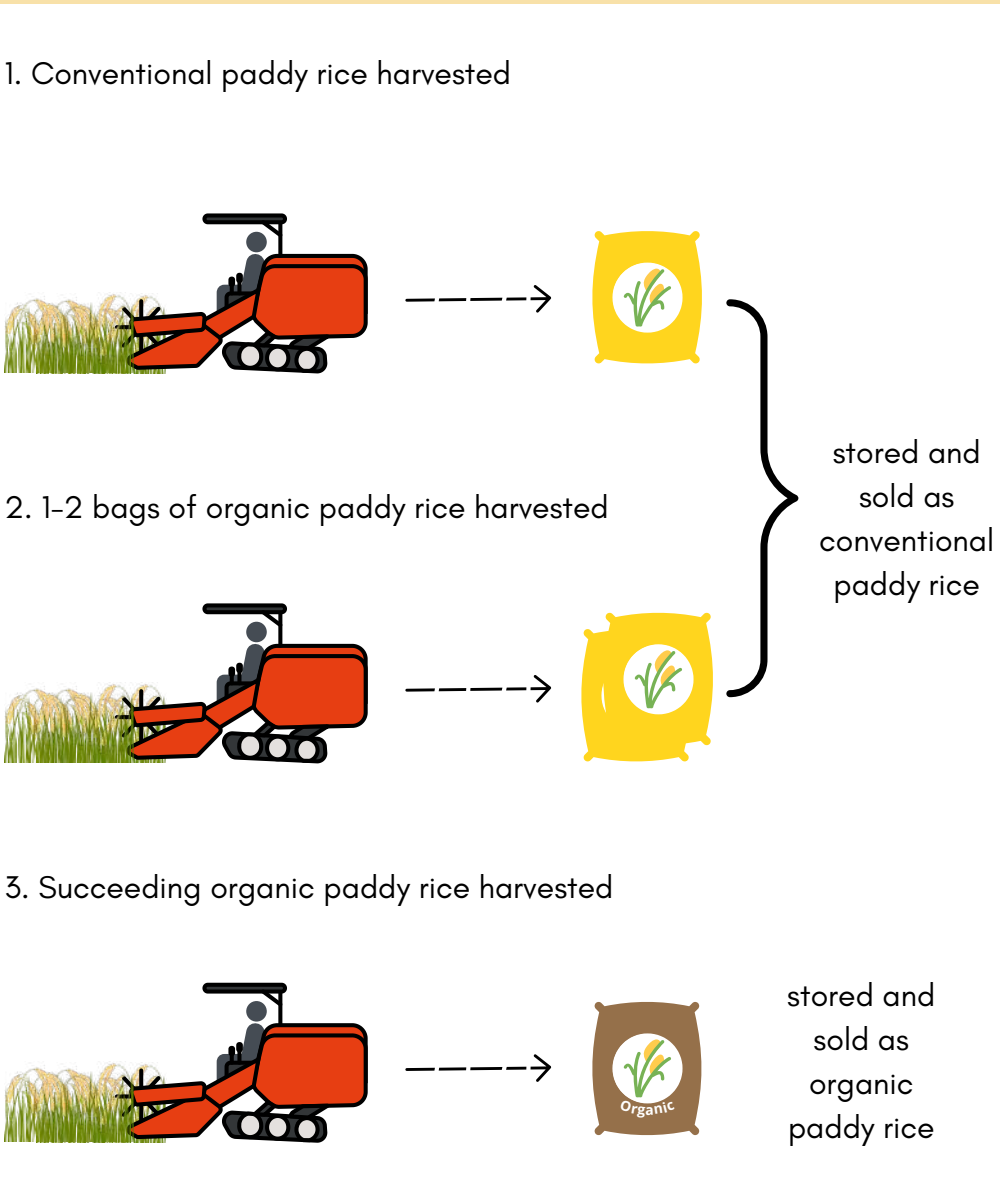

Image 15. **Purging process for harvesting equipment**

4.1.4 Brand new sacks or recycled clean sacks previously used for organic paddy rice shall be used.

4.1.5 Sacks should be properly labeled to avoid mixing organic and conventional paddy rice.

Explanatory Note:

Image 16. **Sample illustration of sack used for harvested paddy rice**

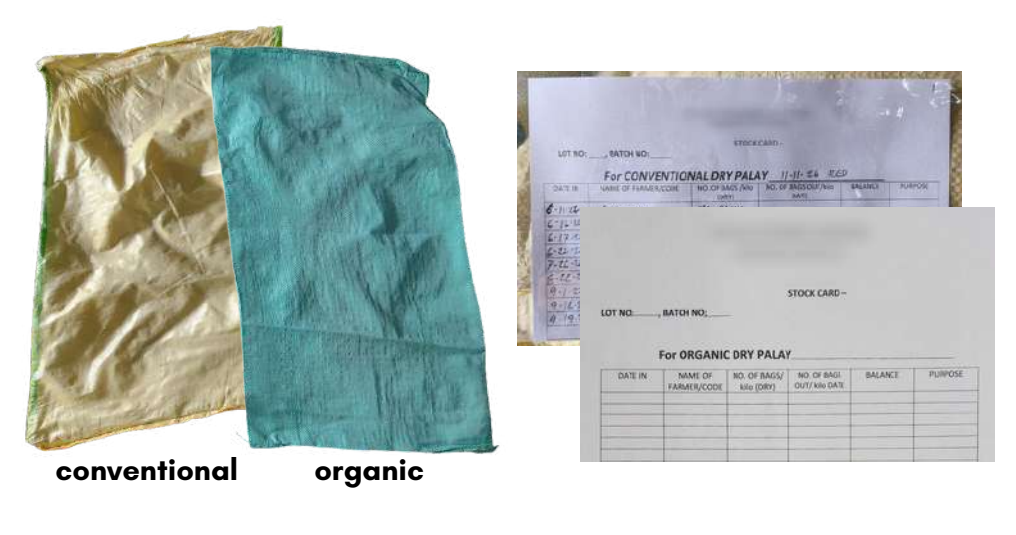

Image 17. **Color-coded sacks and stock cards may be used for identifying sacks of paddy rice.**

4.2 Hauling (farm to dryer)

4.2.1 Organic and conventionally grown paddy rice shall be hauled separately.

4.2.2 The farmer shall haul newly harvested organic paddy rice immediately after harvest.

4.2.3 Hauling facilities to be used for collecting and transporting the harvested organic paddy rice from the farm shall be clean and dry.

Explanatory Note:

Image 18. **Photos of a hauling vehicle used before and during the transport of harvested organic paddy rice**

4.3 Drying

4.3.1 Organic and conventionally grown paddy rice shall be dried separately.

4.3.2 Mechanical drying is recommended in drying organic paddy rice. Clean mechanical dryers shall be used. If possible, a mechanical dryer should be dedicated solely for drying organic paddy rice. If not possible, organic paddy rice shall be dried first before conventionally grown paddy rice.

Explanatory Note:

Image 19. **Mechanical dryers used for drying paddy rice - a) recirculating dryer, and b) flatbed dryer**

4.3.3 Sun drying is allowed; however, drying in highways and roads is strictly prohibited. Drying facilities like concrete pavement (preferably with underlay) shall be properly clean and free from oil spill, manure, residues, and other contaminants before drying

Explanatory Note:

Image 20. **Sun drying of paddy rice on a road is avoided.**

Image 21. **Sun drying of paddy rice on a concrete pavement is recommended.**

Image 22. **Concrete pavement used for sun drying may be sloping.**

4.3.4 During drying, birds and other stray animals shall be kept away from the drying area to avoid contamination of organic paddy rice. Personnel in charge of drying paddy rice shall observe proper hygiene within the premises.

4.3.5 Brand new sacks or recycled clean sacks previously used for organic paddy rice shall be used.

4.3.6 Proper tagging of sacks should be observed to avoid mixing of organic from conventionally grown paddy rice.

4.3.7 Dried organic paddy rice should have a maximum moisture content of 14% when tested by properly verified and adjusted moisture meters.

Explanatory Note:

Image 23. **Moisture meters (laboratory or portable) are used for measuring moisture content.**

4.4 Hauling (dryer to storage)

4.4.1 Organic and conventionally grown paddy rice shall be hauled separately.

4.4.2 Transport facilities shall be properly cleaned every time organic paddy rice are to be hauled.

Explanatory Note:

Image 24. **Hauling vehicles are be cleaned prior to hauling organic paddy rice.**

4.5 Milling

4.5.1 As much as possible, a rice mill should be dedicated solely for milling organic paddy rice.

4.5.2 To avoid contamination, all milling equipment shall be properly cleaned before usage.

4.5.3 Organic and conventional paddy rice shall be milled separately.

4.5.4 If the rice mill is not exclusively used for organic paddy rice, organic paddy rice shall be milled first than conventionally grown paddy rice. However, if the mill was previously used for conventional rice, purging or flushing should be practiced. The amount of the purged or flushed milled rice to be segregated depends on the capacity of the mill. Segregated rice from purging or flushing is considered as conventional.

Explanatory Note:

Purging/flushing is done by milling 1 to 2 bags of organic paddy rice. These sacks of milled rice shall be segregated, documented, and sold as inorganic or conventional products.

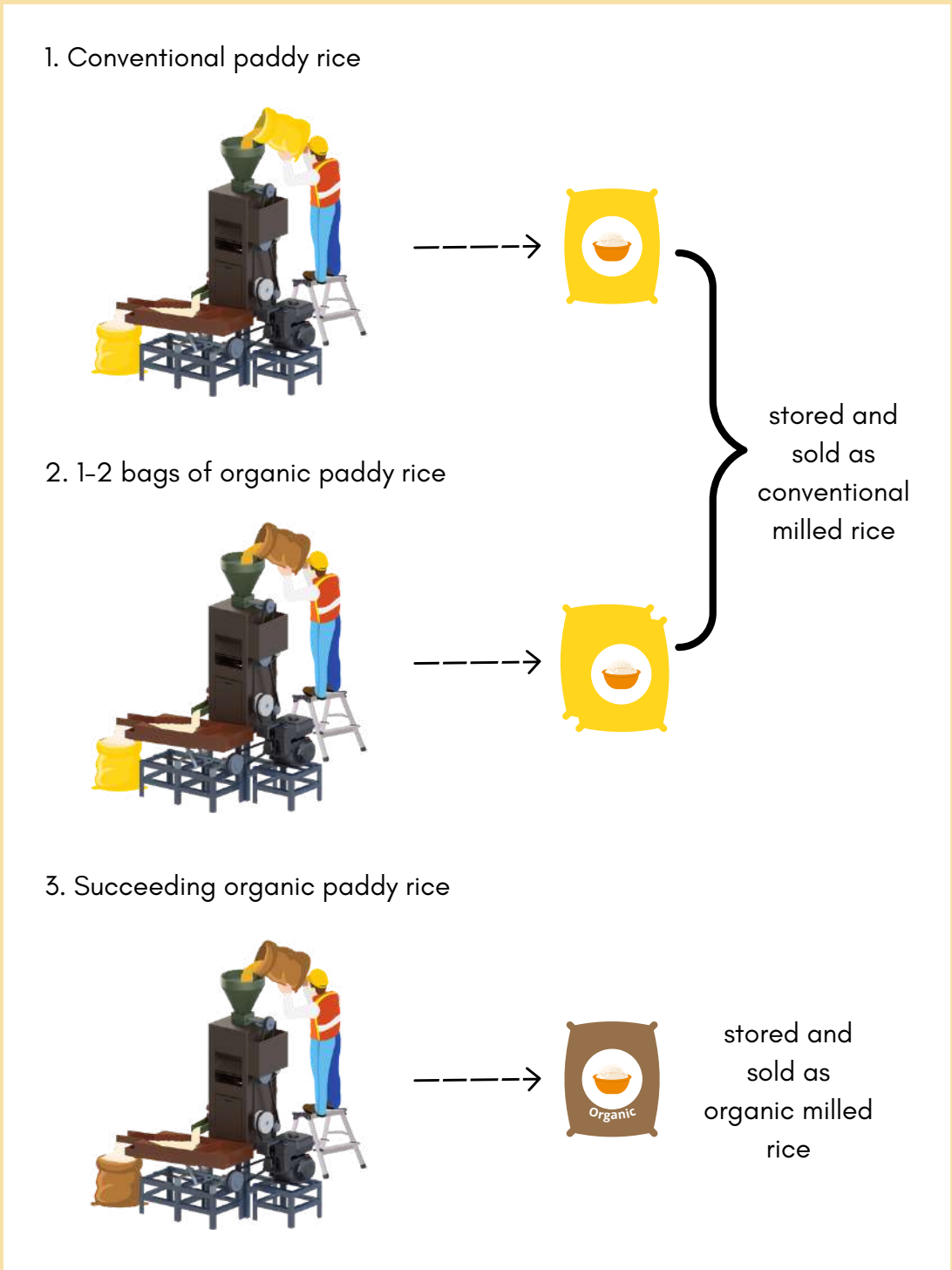

Image 25. **Purging process for milling rice**

4.5.5 Brand new sacks shall be used. Labeling of sacks for organic milled rice shall be in accordance with the requirements of PNS/BAFS XXX:201X Grains - Grading and classification - Paddy and milled rice.

Explanatory Note:

According to PNS/BAFS 290:2019 Grains - Grading and Classification - Paddy and milled rice, the container of packed produce shall be legibly labeled with the following minimum information (DA-BAFS, 2019):

1. Name of the product
2. Grade, type and size classification
3. Net weight in kilograms
4. Brand name
5. Name of producer
6. The words "Product of the Philippines"

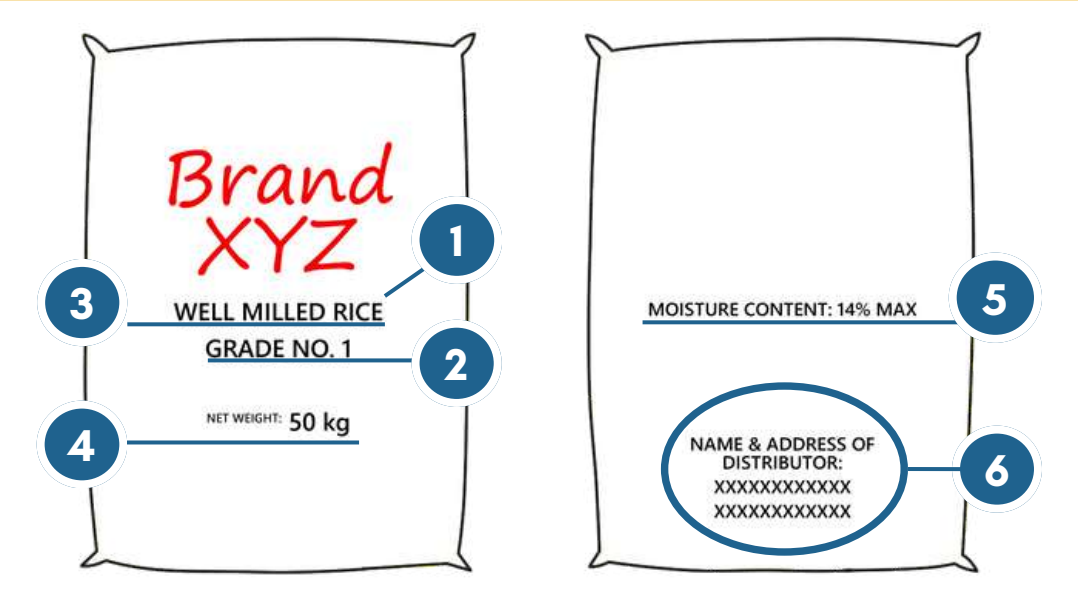

Image 26. **Sample packaging for milled rice**

4.6 Hauling and storage

The storage areas and hauling facilities shall be thoroughly cleaned and free from pests. Cleaning materials should be in accordance with the PNS/BAFS 07 Organic Agriculture and its latest issuance.

Use of botanical sprays is allowed but should not be sprayed directly to the organic milled rice. Operators should always make a record on the amount and kind of botanical sprays used.

Explanatory Note:

According to the Department of Agriculture's Department Circular No. 09 Series of 2020 or the National List of Permitted Substances for Organic Agriculture, the following materials can be used for cleaning and disinfecting equipment and facilities:

Table 1. List of permitted equipment cleansers and disinfectants

Material	Application/conditions
Acetic acid	Cleaning agent
Alcohol, ethyl (ethanol)	For disinfection
Alcohol, isopropyl (isopropanol)	For disinfection
Calcium hydroxide (hydrated lime; slaked lime)	None
Calcium oxide (quicklime)	Cleaning agent
Chloride of lime (calcium hypochlorite, calcium oxychloride, hypochlorous acid calcium salt)	According to regulatory requirements
Citric acid	None
Cyclohexylamine (BWA)	Use only as boiler water additive for packing sterilization
Diethylaminoethanol (BWA)	Use only as boiler water additive for packing sterilization
Formic acid	For disinfection

Table 1. (continued)

Material	Application/conditions
Hydrogen peroxide	For disinfection
Lactic acid	None
Natural essences of plants	None
Octadecylamine (BWA)	Use only as boiler water additive for packing sterilization
Oxalic acid	None
Ozone	None
Peracetic acid	Use only as boiler water additive for packing sterilization; Use as sanitizer on food contact surfaces. Use according to FDA limitations.
Plant extracts	None
Potassium soap (potassium salt of fatty acid, soft soap)	None
Sodium carbonate	None
Calcium hypochlorite	According to regulatory requirements
Chlorine dioxide	According to regulatory requirements
Potassium soap	According to regulatory requirements
Sodium carbonate	None
Sodium hydroxide (caustic soda)	According to regulatory requirements
Sodium hypochlorite (household bleach, liquid bleach)	According to regulatory requirements
Sodium soap	According to regulatory requirements

Source: DA DC No. 9 Series of 2020

Image 27. **Storage facility for milled rice is always maintained clean.**

4.6.1 Hauling of organic milled rice (from mill to storage)

4.6.1.1 Vehicles and other equipment used during hauling shall be properly cleaned prior to loading of organic milled rice. Use of clean pallets during transport shall be observed. However, chemically treated pallets shall not be used.

Explanatory Note:

Image 28. **Spraying pallets with chemicals is not recommended.**

4.6.1.2 Organic milled rice shall not be hauled together with potential sources of contaminants such as oil and chemicals.

4.6.1.3 During hauling, clean tarpaulins and other uncontaminated covering materials shall be used.

Explanatory Note:

Image 29. **Vehicles that can be used for hauling organic milled rice.**

4.6.2 Storage

4.6.2.1 The use of "hooks" is prohibited.

Explanatory Note:

Laborers shall be discouraged and prevented from using hook or “gancho” to maintain the integrity of the bags and avoid spillages. The spillages shall be immediately collected. These collected grains may either be placed into bags (sacks) and piled separately or cleaned and added to busted bags (DA-BAFS, 2017).

Image 30. **Hook or 'gancho'**

4.6.2.2 Organic milled rice shall be stored at a maximum of 14% moisture content (MC).

4.6.2.3 Organic milled rice shall be piled separately from conventional milled rice

Explanatory Note:

Image 31. **Storage for organic and conventional milled rice are properly segregated and labeled.**

4.6.2.4 Proper piling of labeled organic milled rice shall be observed.

Explanatory Note:

In piling and storage of bagged grains, at least one-meter space shall be provided between piles, between piles and walls, and between piles and posts to facilitate cleaning and pest control measures (DA-BAFS, 2017).

Image 32. **Bagged grains are piled:**
a) between piles
b) between piles and walls
c) between piles and posts

4.6.2.5 In case there is suspicion of traces of pesticides in the storage facilities, these should be removed by using the appropriate cleaning agent and water prior to storage.

4.6.2.6 Proper waste disposal of biodegradable and non-biodegradable materials shall be observed.

Explanatory Note:

Image 33. **Waste disposal can be labeled or color coordinated.**

4.6.2.7 First-in, first-out principle shall be observed.

4.6.2.8 Chemically treated pallets shall not be used in the warehouse.

4.7 Pest management in storage

4.7.1 Physical control or preventive measures are encouraged for pest management.

Explanatory Note:

According to PNS/BAFS 07:2016 Organic Agriculture, the following measures for pest management and control should be used (DA-BAFS, 2016):

- preventive methods, such as disruption and elimination of habitat and access to facilities by pest organisms, should be the primary methodology of pest management;
- if preventative methods are inadequate, the first choice for pest control should be mechanical/physical and biological methods; and
- if mechanical/physical and biological methods are inadequate for pest control, substances appearing below (or other substances allowed for use by a competent authority) may be used provided that they are accepted for use in handling, storage, transportation, or processing facilities by the competent authority and so that contact with organic products is prevented. Any succession/addition/revision from relevant standard-setting bodies (BAFS or FDA) shall be adopted and shall be in accordance with the criteria established in Section 12 of PNS OA.

Table 2. Crop Protectants and Biological Control Agents

Substances Description, Compositional Requirements	Conditions for Use
Plant and Animal Origin	
Chitin nematicides	Chitin nematicides should not be processed by acid hydrolysis
Coffee grounds	None
Corn gluten meal	None
Fermented product from Aspergillus	e.g. vinegar
Plant and animal oils	None
Plant and plant products	Include plant preparations, extracts, and other products derived form plants
Plant-based repellents	None

Table 2. (continued)

Substances Description, Compositional Requirements	Conditions for Use
Preparations from *Quassia amara*	None
Preparations from Ryania (*Ryania speciosa)*	None
Preparation of *Chrysanthemum cinerariaefolium*	Use for synthetic Piperonyl butoxide as synergist to Chysanthemum preparation is prohibited
Preparations or products form Neem (*Azardirachta indica)*	None
Preparations of Rotenone from *Derris elliptica*, *Lonchocarpus*, *Thephrosia* spp.	The substance should be used in such a way as to prevent its flowing into waterways
Sabadila	None
Tobacco tea	Pure nicotine is prohibited
Mineral Origin	
Calcium hydroxide (C2.3, D.1.17, D2.4) Other name(s): hydrated lime, slaked lime	For foliar application only
Calcium oxide (B.2.3, C.2.5, D.2.5) Other name: Quicklime	Limited for the preparation of Bordeaux mixture
Chloride of lime (A.2.2.5, C.2.4, D.2.6) Other name(s): Calcium hypochlorite, calcium oxychloride, hypochlorous acid calcium salt	None
Copper salts e.g. sulfate, hydroxide, oxychloride, octonoate, cuprous oxide, Bordeaux mixture and Burgundy mixture	As fungicide on condition that the substance used in such a way as to minimize copper accumulation in the soil. Restricted to a maximum application of 6 kg/ha per year
Diatomaceous earth (D.1.26)	None
Iron phosphates	None
Lime sulfur (Calcium polysulfide)	None
Paraffin oil	None
Potassium bicarbonate (A.4.9, C.2.27) Other name(s): potassium hydrogen carbonate, potassium acid carbinate, carbinic acid, potassium ion bicarbonate	None
Potassium permanganate (C.2.2.7) Other name(s): Chameleon mineral, Condy's crystals, argucide	None

Table 2. (continued)

Substances Description, Compositional Requirements	Conditions for Use
Potassium soap (B.2.17, C.2.31, D.2.21) Other name(s): potassium salt of fatty acid, soft soap	None
Sodium bicarbonate (C.1.24)	None
Sulfur (in elemental form)	None
Sulfur dioxide (D.1.80)	None
Mineral oils	None
Microbiological	
Bacterial preparations (A.1.1) e.g. *Bacillus thuringiensis*, *Bacillus subtilis*	None
Fungal preparations e.g. *Metarhizium anisopliae*, *Trichoderma harzianum*, *Beauveria bassiana*	None
Spinosad	Use only where meassures are taken to minimize the risk to parasitoids and to minimize the risk of development of resistance.
Viral preparations e.g. granulosis virus, Nuclear Polyhedrosis Virus (NPV), baculovirus, etc.	None
Others	
Mulches (including plastic mulch) nets	None
Pheromones and attractants	Use in traps and dispensers only
Preparations on the basis of metaldehyde containing a repellent to higher animal species	As far as applied in traps
[Release of] parasites, predators and sterilized insects e.g. *Trichogramma* sp., ladybird beetle, earwig and lacewing	Release should be subject to appropriate existing phytosanitary regulations and measures
Rodenticides	None
Thermal controls	None
Traditional preparations (of non-synthesized chemical nature) based on natural products	None
Physical methods (e.g. chromatic traps, mechanical traps)	None

Source: DA DC No. 9 Series of 2020

Image 34. **Botanicals, such as kakawate leaves, can be used to repel insects.**

Image 35. **Traps may be installed to control pests.**

4.7.2 Pest control measures using chemical pesticides of stored organic rice shall not be allowed.

4.7.3 There shall never be direct or indirect contact between organic rice and prohibited substances (e.g. pesticides). When any doubt arises, it shall be ensured that no residue in the organic rice is detected.

4.7.4 Irradiation of the organic rice for pest control is prohibited.

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Technical Working Group

Department of Agriculture
Technical Working Group (TWG) on the Development of the
Explanatory Manual for Organic Milled Rice - Code of Practice - Postproduction

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This Explanatory Manual (EM) serves as supplementary material for the Philippine National Standard (PNS) Organic Milled Rice Code of Practice - Postproduction. The EM aims to aid stakeholders by presenting uniform understanding and interpretation of the PNS to ensure efficient adoption and implementation of the Standard.


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