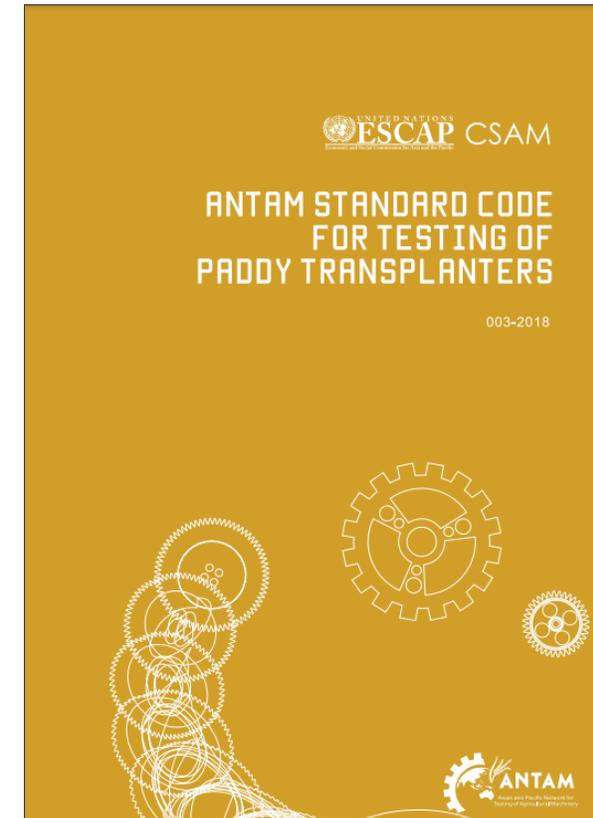
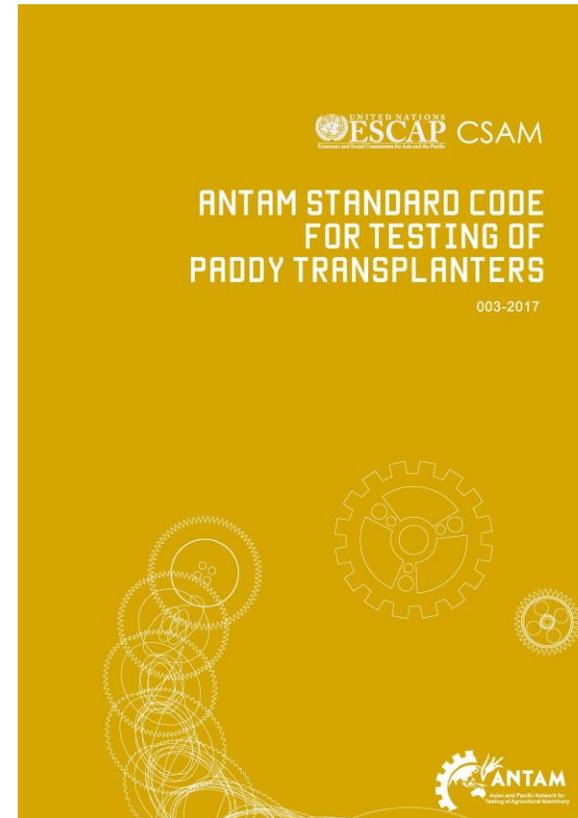


TWG Report on the revision of ANTAM test code on Paddy Transplanter



Review of the ANTAM Test Code 003-2018

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Mission of the ANTAM

- To ensure sustainable and high quality of agricultural machinery (production, trading and using)

Objectives

- Development and adoption of harmonized testing codes and procedures of testing;
- Determination a common testing methodologies based on harmonize standards;
- Upgrade and improve existing testing facilities of participating countries;
- Reduce the social cost of production and
- Facilitate intraregional trade of sustainable agricultural machinery.

Paddy Transplanter code 003-2017

Paddy Transplanter code 003-2018

Paddy Transplanter Code 003-2022

Walk-Bhind type paddy transplanter



04- rows and 06 rows type

Riding type paddy transplanter



06 - rows and 08 rows type



Safety measures

This Test Code covers the terminology, general guidelines and tests to be conducted on self-propelled walk behind and riding type paddy transplanters with mat type seedlings. It also covers methodology for verification of machine specifications, performance, evaluation, **basic safety requirements**, data collection and test report format. Paddy transplanters that are already for commercial production or already in production should be tested with reference to this Code.

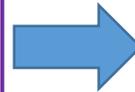
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3.0 Terminology

3.1 Paddy transplanting and

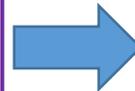
3.7 Leaf stage of seedlings

3.1 Technique of placing paddy seedlings from one location to another. The first location may be specially prepared nursery in controlled or uncontrolled conditions or normal paddy field.



Technique of placing paddy seedlings to the field.

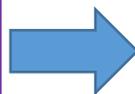
3.7 Leaf stage indicates the number of leaves or height of the seedling. (Seedlings, average between 3 to 6 leaves suitable for machine transplanting).



Leaf stage indicates the number of leaves.

□ Review of Test code 03 2018

4.2 The manufacturer/applicant shall run-in the transplanter before the test, under his responsibility and in accordance with his usual instructions. The running-in shall be carried out in collaboration with the testing authority. If this procedure is impracticable due to the transplanter being an imported model, the testing authority may itself run-in the transplanter in accordance with the procedure prescribed or agreed to with the manufacturer/applicant. The place and duration of the running-in shall be reported in the Performa given in Annex B.



4.0 General Guidelines

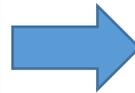
4.2 Running-in

The manufacturer/applicant shall run-in the transplanter before the test, under **their** responsibility and in accordance **with the procedure prescribed or agreed with the manufacturer/applicant and in any case in ordinary condition.** The running-in shall be carried out in collaboration with the testing authority. If this procedure is impracticable due to the transplanter being an imported model, the testing authority may itself run-in the transplanter in accordance with the procedure prescribed or agreed to with the manufacturer/applicant. The place and duration of the running-in shall be reported in the Performa given in Annex B.



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4.4 Fuels and lubricants to be used from the range of products commercially available in the country where the equipment is tested and shall conform to the minimum standards approved by the transplanter manufacturer. If the fuel or lubricant conforms to a national or international standard, it shall be mentioned, and the standard stated (OECD Code 2-2017).



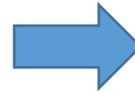
4.4 Fuels and Lubricants

Fuels and lubricants to be used from the range of products commercially available in the country where the equipment is tested and shall conform to the minimum standards approved by the transplanter manufacturer. If the fuel or lubricant conforms to a national or international standard, it shall be mentioned, and the standard stated **(OECD Code 2-2020 or its updates)**.

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6.1 Tests to be conducted on paddy transplanter are given below:

- Checking of specifications - Safety requirements
- Parking brake test
- Noise test
- Water proof test
- Field performance test



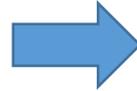
6.0 Test

Tests to be conducted on paddy transplanter are given below:

- Checking of specifications
- **Basic** safety requirements
- Parking brake test **(if applicable)**
- Noise test
- Water proof test
- Field performance test **(Machine performance and Transplanting performance)**

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9.1 The exposed transmission and rotating parts should have protective cover (GB 10395.9, Japan 2015).



9.0 Safety Requirements

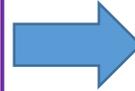


The exposed transmission and rotating parts should have protective cover (GB 10395.9, Japan 2015) and should not allow any contact to any part of the operator's body unless they affect the functionality of the machine. In this case a list of un-protected moving parts has to be mentioned as a “residual risk list” and appropriate markings has to be put on the machine as well as appropriate information in the user manual.

□ Review of Test code 03 2018

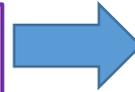
9.0 Safety Requirements

9.2 The position and the direction of the exhaust port shall avoid the driver and other operators who are supposed to stand on the machine.



The position and the direction of the exhaust port shall avoid **the operator reducing the risk of exposure to emissions as well as contact to high temperature parts.**

9.4 The row marker should have locking mechanism.



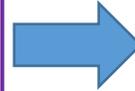
The row marker **(if applicable)** should have locking mechanism

□ Review of Test code 03 2018

9.0 Safety Requirements

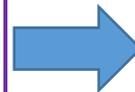


9.5 The operation symbols should be pasted near the key controls. There should be a minimum gap of at least 25mm between the control levers (GB 10395.9, Japan 2015).



The operation symbols should be **placed visibly** near the key controls. There should be a minimum gap of at least 25mm between the control levers (GB 10395.9, Japan 2015).

9.8 Riding type transplanters should be equipped with footsteps on both sides. .

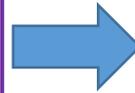


Riding type transplanters should be equipped with footsteps on both sides **with maximum height of 55 cm from the ground.**

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10.0 Parking Brake Test

10.2 Procedure: Riding type transplanters shall be parked with parking brake applied, on a hard-dry slope of 18 percent facing uphill and downhill slopes. Transplanter may be in unload condition with transplanting assembly in up position. The movements of the braked wheel should be observed for at least 5 minutes. (ANTAM 001-2017)



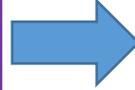
Riding type transplanters shall be parked with parking brake applied, on a hard-dry slope of 18 percent facing uphill and downhill slopes. Transplanter **shall** be in unload condition with transplanting assembly in up position. The movements of the braked wheel should be observed for at least 5 minutes. (ANTAM 001-2017)

□ Review of Test code 03 2018

11.0 Noise Test

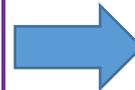


11.4 The air temperature shall be in the range from **+10 to 40 °C** and the wind velocity shall not exceed 5 m/s at the operator's position.



The air temperature shall be in the range from 10 to 40 °C and the wind velocity shall not exceed 5 m/s at the operator's position.

11.5 The ear side noise of the operator shall be no more than 90 dB(A) in operating condition at maximum speed (GB/T 20864-2007).



The ear side noise of the operator shall be no more than 90 dB(A) in operating condition at maximum speed (GB/T 20864-2007).

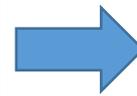
Proposed to: When the ear side noise of the operator exceeds the national limit, ear protective equipment should be supplied to the operator.

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12.0 Field Test

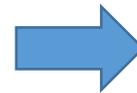
12.1 General

12.1.3 Test site conditions: The transplanter shall be tested in a proper field condition. The field shall be prepared for transplanting operation and shall have an area of at least 1000 sq. meter. It shall have a rectangular shape with ratio of **1:2.5**



Test site conditions: The transplanter shall be tested in a proper field condition. The field shall be prepared for transplanting operation and shall have an area of at least 1000 sq. meter. It shall have a rectangular shape with ratio of 1:2.5

12.1.4 Test Instruments/Equipment. The test instruments shall be calibrated. The list of test instruments used to carry out transplanter test shall be presented in Annex F.



Test Instruments/Equipment. The test instruments shall be calibrated **before using**. The list of test instruments used to carry out transplanter test shall be presented in Annex F.

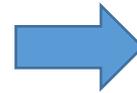
□ Review of Test code 03 2018

12.0 Field Test

12.1 General

12.1.7 Seedlings Conditions shall be obtained as follows:

- Age of seedlings (Days)
- Variety
- Plant density⁸ (No. of plants per cm²) - Leaf stage (No. of leaves)
- Height of seedlings (mm)
- Thickness of seedling mat (mm)



Seedlings Conditions shall be **recorded** as follows:

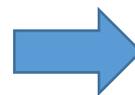
- Age of seedlings (Days)
- Variety
- Plant density (No. of plants per cm²)
- Leaf stage (No. of leaves)
- Height of seedlings (mm)
- Thickness of seedling mat (mm)

□ Review of Test code 03 2018

12.0 Field Test

12.1 General

- 12.1.8 The actual field condition shall be obtained as follows:
- Area (L x W) (m²)
 - Soil Type
 - Soil hardness [Cone depth (mm)], (Drop cone test)
 - Depth of hard pan (mm)
 - Depth of water (mm)
 - **Qualitative assessment (leveling, stubble)**
 - **Method of tillage**
 - **Method of puddling**

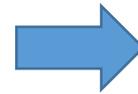


- The actual field condition shall be **recorded** as follows:
- Area (L x W) (m²)
 - Soil Type
 - **Soil hardness/Drop cone test (Cone depth (mm))**
 - **Depth of hard pan/Foot Zinkage (mm)**
 - Depth of water (mm)
 - Qualitative assessment (leveling, stubble)
 - Method of tillage
 - Method of puddling

□ Review of Test code 03 2018

12.2.2 The actual performance shall start by operating the transplanter in the field. The following shall be gathered to calculate actual field capacity, field efficiency, and percentage of slippage and fuel consumption.

- Time of transplanting
- Total operation time (h)
- Average operating speed (km/h)
- Effective working width (mm)
- Wheel slippage (without and with load) (percent)
- Noise level at operator's ear level (db(A))
- Fuel consumed (kg or liter)



12.0 Field Test

12.2 Performance Data

The actual performance shall start by operating the transplanter in the field. The following shall be gathered to calculate actual field capacity, field efficiency, and percentage of slippage and fuel consumption.

- **Date and time of transplanting**
- Total operation time (h)
- **Transplanting time (h)**
- Average operating speed (km/h)
- Effective working width (mm)
- Wheel slippage (without and with load) (percent)
- Noise level at operator's ear level (dB(A))
- Fuel consumed (kg or liter)

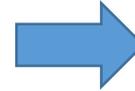
Specific fuel consumption may be calculate (liter/h/hp).

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12.0 Field Test

12.2 Performance Data

12.2.3 Transplanting Pattern. **Only one transplanting pattern shall be followed either Pattern A or Pattern B depending on the location and specific requirements of region.**



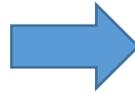
Transplanting Pattern. Only one transplanting pattern shall be followed either Pattern A or Pattern B depending on the location and specific requirements of region.

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12.0 Field Test

12.4 Wheel Slippage

12.4 The distance travelled shall be measured at 10 revolutions of the driving wheels at level field in dry condition. A visible mark shall be placed on the wheels for obtaining the number of revolutions. During transplanting the distance for ten revolutions of the driving wheel shall also be obtained. In both conditions, same speed of the transplanter shall be maintained (RNAM 1983).



The distance travelled shall be measured at 10 revolutions of the driving wheels at level field in dry condition. A visible mark shall be placed on the wheels for obtaining the number of revolutions. During transplanting the distance for ten revolutions of the driving wheel shall also be obtained. In both conditions, same speed **and same load** of the transplanter shall be maintained (RNAM 1983).

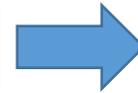
□ Review of Test code 03 2018

12.0 Field Test

12.5 Uniformity of transplanting

12.6 Fuel Consumption

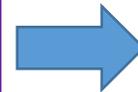
12.5 Uniformity of transplanting



Uniformity of transplanting

Quality of Transplanting

12.6 The volume and weight of fuel consumed shall be obtained by refilling method. The fuel tank of the engine shall be filled to full level and shall be refilled after the test. The amount of fuel refilled shall be the amount of fuel consumed.



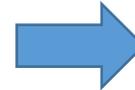
The volume and weight of fuel consumed shall be obtained by refilling method. The fuel tank of the engine shall be filled to full level **before beginning the test and then** refilled after each trial. The amount of fuel refilled shall be the amount of fuel consumed.

□ Review of Test code 03 2018

13.0 Waterproof Test

13.1 General

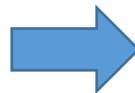
13.1 The paddy transplanter is classed as “water proof paddy transplanter,” if after the test described below, there is no water penetration into axle, seals and planting system and there is no abnormality in functioning of working parts (4.9.1 OECD Code 2-2014).



The paddy transplanter is classed as “water proof paddy transplanter,” if after the test described below, there is no water penetration into axle, seals and planting system and there is no abnormality in functioning of working parts **(4.9.1 OECD Code 2-2020 or its updates)**.

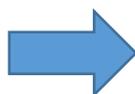
□ Review of Test code 03 2018

13.3.1.1 The setting gear position shall be maximum range which the transplanter has, and engine rpm shall be about 90% of the rated rpm operated continuously for 10 hours.



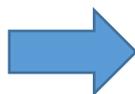
The setting gear position shall be maximum range which the transplanter has, and engine rpm shall be about 90% of the rated **maximum** rpm operated continuously for 10 hours.

13.3.1.3 The transplanter shall be operated under the normal condition without carrying seedlings, but 5.5 kg weight shall be replaced for each row to be loaded on the seedling board in place of seedling.



The transplanter shall be operated under the normal condition without carrying **real seedlings**, but 5.5 kg **artificial weight** shall be replaced for each row to be loaded on the seedling board in place of seedling.

13.3.1.7 Data shall be recorded in Annexure E.



Data shall be recorded in **Annex E-3**.

Proposal for future work

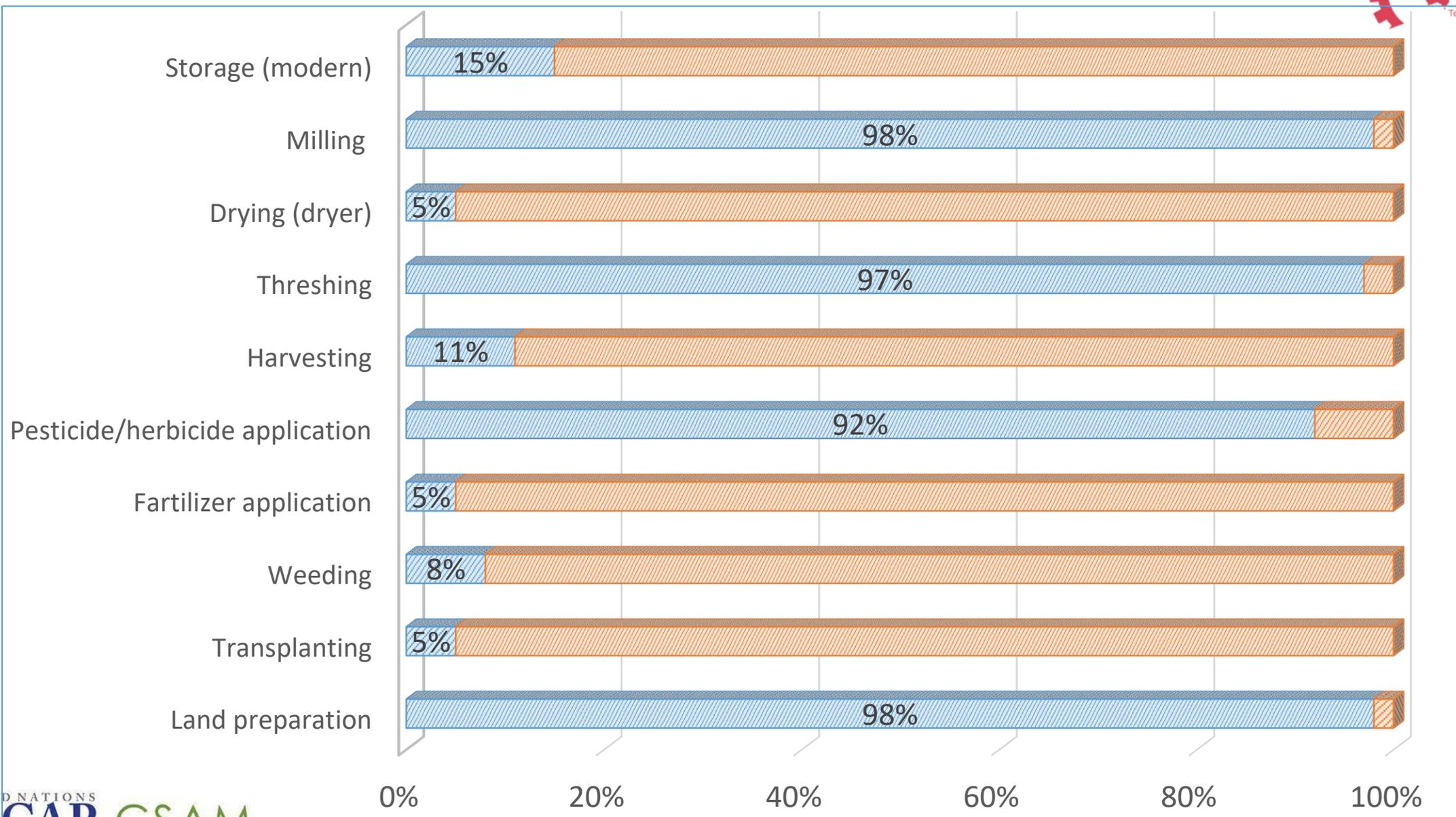
- 1. Minimum service period of warranty**
- 2. Spare parts replacement warranty within a specific period of time**
- 3. Identification of the fast moving parts of the machine**

Scope of using the code in Bangladesh

Where we are?

Mechanical

Manual



Others: Major barriers to mechanized paddy transplanting

1. Mat type seedling raising
 1. Top soil of the land
 2. Disease infestation during cold season
 3. Uniformity
 4. Special care
 5. Mind setup
6. Man behind the machine
7. Problems to operate in the field where plough pan depth >20-25 cm
8. Problems to operate in the water logged field >15 cm
9. Parts un availability
10. Variation of line to line spacing
11. Plastic tray (additional investment)

Recommendations

1. Execution of the code – high level mutual policy
2. Authorized testing body /center – approved by the CSAM
3. Strengthening testing center by providing equipment from CSAM
4. Ensure certification under policy

Acknowledged

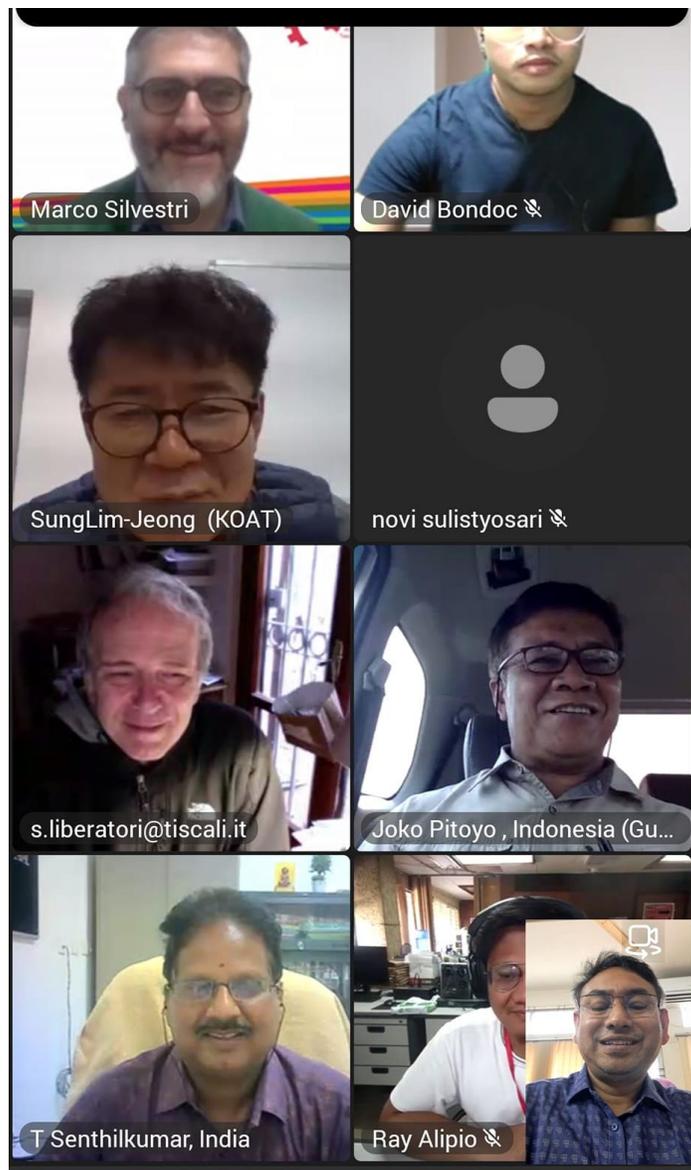
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Name	Country
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Dr. Joko Pitoyo	Indonesia
Mr. Takashi Fujimori	Japan
Mr. Mohd Shahril Shah bin Mohamad Ghazali	Malaysia
Mr. Romulo Esteban Eusebio	Philippines
Mr. Anuradha Wijethunga	Sri Lanka
Dr. Isara Chaorakam	Thailand
Mr. Erol Akdemir	Turkey
Mr. Ngo Van Phuong	Vietnam

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Mr. Takashi Fujimori	Japan
Mr. Mohd Shahril Shah bin Mohamad Ghazali	Malaysia
Dr. Shabbir Ahmad Kalwar	Pakistan
Mr. Romulo Esteban Eusebio	Philippines
Mr. Jeong Seong lim	Republic of Korea
Mr. Anuradha Wijethunga	Sri Lanka
Dr. Yuttana Khaehanchanpong	Thailand
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TWG on Paddy Transplanter



TWG Members on paddy Transplanter, 2022

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Mr. <u>Joko Pitoyo</u> Ms. <u>Novy Sulistyosari</u>	Indonesia
Mr. <u>Mohd Shahril Shah bin Mohamad Ghazali</u>	Malaysia
Mr. <u>Muzammil Husain</u>	Pakistan
Mr. Ray D. <u>Alipio</u> Ms. Janice Vargas	Philippines
Mr. <u>Jeong Seong-lim</u> Mr. Kim <u>Eun-kuk</u>	Republic of Korea
Mr. <u>Vitaly Maslovski</u> Mr. Eduard Perov	Russian Federation
Mr. <u>Anuradha Wijethunga</u>	Sri Lanka
Mr. <u>Onder Gungor</u>	Thailand
Mr. Ngo Van Phuong	Viet Nam

- TWG members on Paddy Transplanter are deeply acknowledged for the work done and the quality of discussion**
- David Bondoc and Marco Silvestri, CSAM, for the administration and technical workflow**

Thank you for listening patiently