PHILIPPINE NATIONAL STANDARD

PNS/PAES 151:2015
(PAES published 2015)
ICS 65.060.30

Agricultural machinery – Mechanical rice transplanter – Specifications

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National Foreword

The Philippine Agricultural Engineering Standards PAES 151:2015, Agricultural machinery – Mechanical rice transplanter – Specifications was approved for adoption as Philippine National Standard by the Bureau of Philippine Standards upon the recommendation of the Agricultural Machinery Testing and Evaluation Center (AMTEC) and the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development of the Department of Science and Technology (PCAARRD-DOST).

This standard cancels and replaces PNS/PAES 151:2010 (PAES published 2010).

Foreword

The revision of this national standard was initiated by the Agricultural Machinery Testing and Evaluation Center (AMTEC) under the project entitled "Development of Standards for Rice Production and Postproduction Machinery" which was funded by the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD) of the Department of Science and Technology (DOST).

This standard has been technically prepared in accordance with PAES 010-2 – Rules for the Structure and Drafting of International Standards.

The word "shall" is used to indicate mandatory requirements to conform to the standard.

The word "should" is used to indicate that among several possibilities one is recommended as particularly suitable without mentioning or excluding others.

In preparation of this standard, the following documents/publications were considered:

Campbell, J.K. 1990. Dibble sticks, donkeys, and diesels. International Rice Research Institute. ISBN 971-104-185-5. 147-150.

Eam-o-pas, K. and Y. Goto. 1990. Comparative performance of the rice transplanters in Thailand's field conditions. Kasetsart J. (Nat.Sci. Suppl.) Vol.24:64-68.

Eam-o-pas, K., V. Munthimkarn, N. Ounkong, Y Goto and T. Yamauchi. 1988. Performance of a self-propelled riding type rice transplanter. Kasetsart J. (Nat.Sci. Suppl.) Vol.22:79-87.

Regional Network for Agricultural Machinery.1983. Test codes and procedures for farm machinery. Technical Series No.12. Economic and Social Commission for Asia and the Pacific.

Regional Network for Agricultural Machinery. 1979. Rice transplanter: highlights of research, design, development and evaluation from different countries. RNAM Digest 1. 43pp.

Thein, M. Mechanical rice transaplanters in Burma.

1 Scope

This standard specifies the requirements for manufacture and performance of an engine driven mechanical rice transplanter.

2 References

The following normative documents contain provisions, which through reference in this text, constitute provisions of this National Standard:

AWS D1.1:2000 Structural Welding Code – Steel

PNS/PAES 102: 2000 Agricultural Machinery – Operator's Manual – Content and Presentation

PNS/PAES 152:2015 Agricultural Machinery – Mechanical Rice Transplanter – Methods of Test

3 Definitions

For the purpose of this standard, the following definitions shall apply:

3.1
grasping fork
part of the transplanting arm that picks rice seedlings

3.2
mechanical rice transplanter
machine designed for transplanting rice seedlings into a puddled and levelled field

3.3
paddle wheel
modified wheel used in transplanters to facilitate movement in the field

3.4
soil-bearing seedlings
rice seedlings grown in nursery for transplanting wherein the soil is retained with the roots for transplanting

3.5
transplanting
method of crop establishment for rice wherein rice seedlings grown in a nursery are pulled and transferred into puddled and levelled fields

3.6
transplanting arm
part of the mechanical transplanter that actuates picking and transplanting seedlings into a puddled field

4 Classification

The mechanical rice transplanter shall be classified according to the following:

4.1 Riding type

Type of self-propelled rice transplanter that allows operator to ride on the machine during operation (Figure 1)

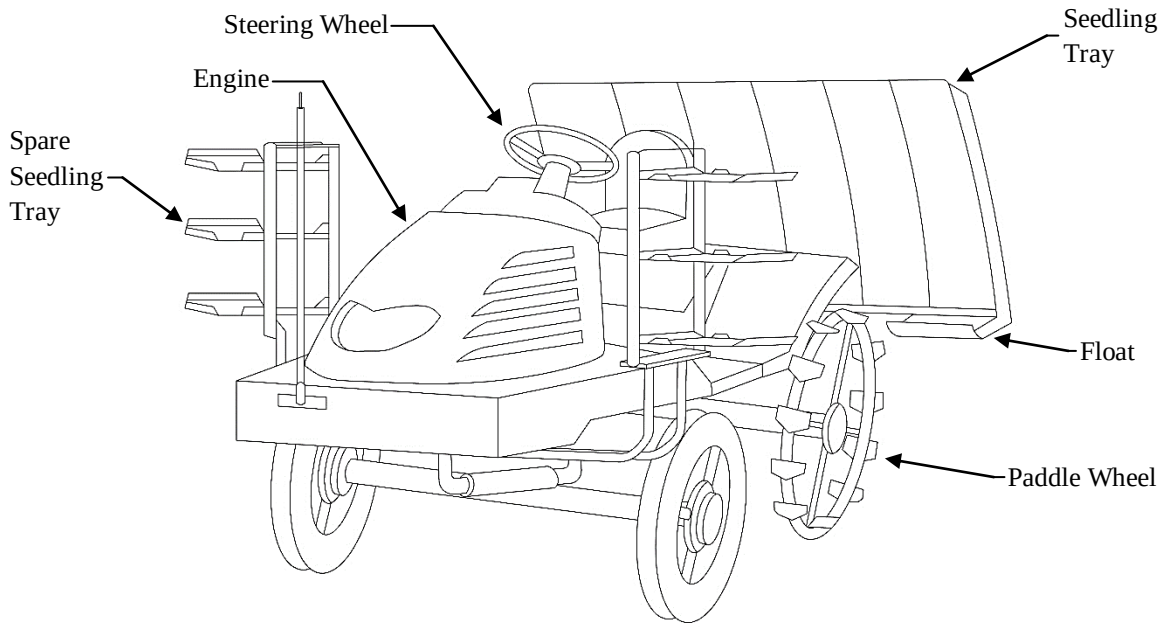

Figure 1 - Four-wheel riding type rice transplanter

4.2 Walk-behind type

Type of self-propelled rice transplanter wherein the operator walks behind the transplanter during operation (Figure 2).

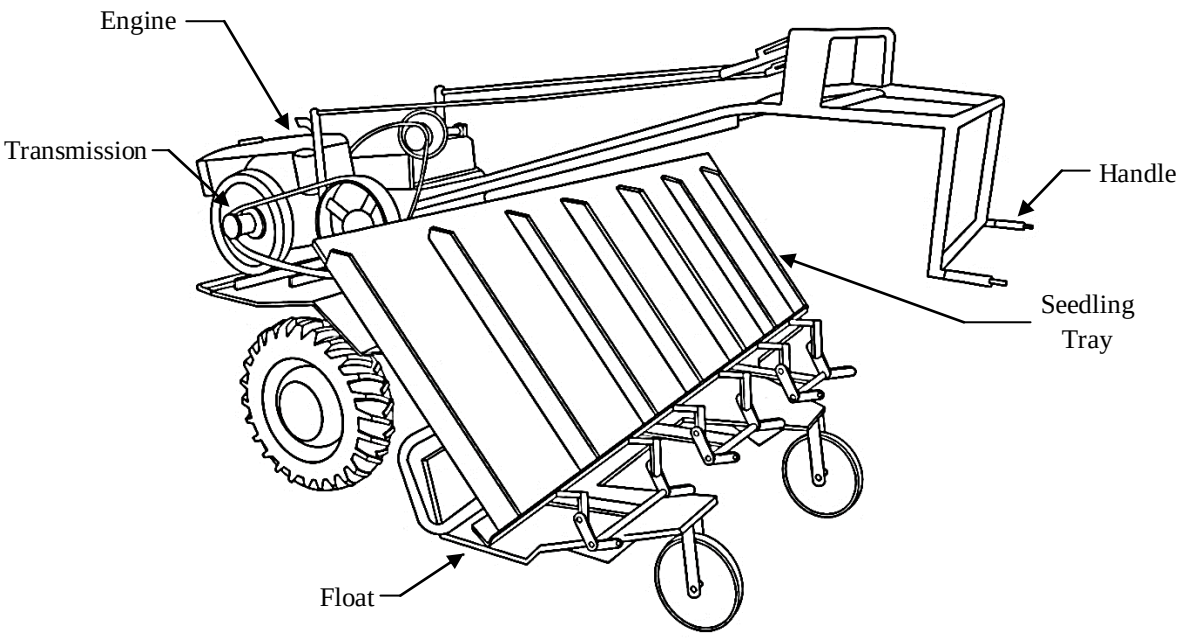

Figure 2 - Walk-behind rice transplanter

5 Principle of Operation

Rice seedlings grown in the nursery shall be placed on the seedling tray of the mechanical rice transplanter. As the rice transplanter moves along the puddled field, the grasping fork of the transplanting arm shall get a preset number of seedlings out of the seedling mat. The transplanting arm shall be actuated by a cam assembly, which is connected to the PTO shaft of a tractor. The seedlings shall then be directed into the puddled soil. Afterwards, the transplanting arm shall reset back to its original position for the next stroke.

6 Manufacturing Requirements

The mechanical rice transplanter shall consist of seedling tray, transplanting arms, grasping forks and float or floatation structure. Spacing between each transplanting arm shall be uniform.

6.1 The seedling tray shall be made of non-corrosive material (e.g. engineering plastic).

6.2 The float shall be made of non-corrosive material (e.g. engineering plastic) with at least 13 mm thickness and with a width of at least 152 mm.

6.3 The transplanting arm shall be made of G.I. steel or better material with at least 10 mm diameter. It shall have a uniform spacing of at least 200 mm.

6.4 The grasping forks shall be made of G.I. plain sheet gauge #24 or better material.

6.5 All bearings shall be sealed to prevent water and dirt from entering it.

6.6 All welded parts shall be in accordance with the criteria set in AWS D1.1:2000.

6.6.1 There shall be no crack on welded area.

6.6.2 There shall be fusion between adjacent layers of weld metal and between weld metal and base metal.

6.6.3 All craters shall be filled to provide the specified weld size, except for the end of intermittent fillet welds outside of their effective length.

6.6.4 Weld profiles shall be in its acceptable form.

6.6.5 Welded joints shall not be less than 4 mm site fillet weld.

6.6.6 Undercut shall not exceed 2 mm for any length of weld.

6.7 The handle shall be covered with a non-slip material (e.g. rubber).

6.8 The paddle wheel shall be made of G.I. steel or better material. The wheel depth shall be adjustable.

6.9 Guide wheels shall be made of G.I. steel or better material.

7 Performance Requirements

7.1 There shall be a field efficiency of at least 80%.

7.2 The grasping fork shall pick rice seedlings uniformly.

7.3 The distance between hills and rows shall be uniform based on the desired setting.

7.4 The percent damaged hills and percent missing hills shall not exceed 10%.

7.5 The seedlings shall be planted at a uniform depth based on the desired setting.

8 Power Requirement

8.1 The mechanical rice transplanter shall be operated using a minimum of 2.5 hp (1.9 kW) engine for walk-behind and a minimum of 4 hp (3 kW) for ride-on type.

9 Safety, Workmanship and Finish

9.1 The mechanical rice transplanter shall be painted and shall have a rust-free finish.

9.2 Chain and sprocket or belt and pulley assembly shall be covered.

9.3 All bolts shall conform to standards for strength application and shall be made of hot-galvanized steel for corrosion resistance.

9.4 The mechanical rice transplanter shall be free from sharp edges.

10 Warranty of Construction and Services

10.1 One (1) year warranty on parts and services, in accordance to the manufacturer's warranty policy, shall be provided. This shall start upon the acceptance of the mechanical rice transplanter by the end user.

10.2 There shall be no breakdown of its major components under normal use within one (1) year from acceptance of the mechanical rice transplanter by the end-user, in accordance to the manufacturer's warranty policy.

11 Maintenance and Operation

11.1 An operator's manual, which conforms to PNS/PAES 102:2000 Agricultural Machinery – Operator's Manual – Content and Presentation shall be provided.

12 Testing

Testing of the mechanical rice transplanter shall be conducted on-site. It shall be tested for performance in accordance with PNS/PAES 152: 2015 - Agricultural Machinery: Mechanical Rice Transplanter – Methods of Test.

13 Marking and Labeling

13.1 The mechanical rice transplanter shall be marked in English, with the following information, using a plate, stencil or by directly punching it at the most conspicuous place:

13.1.1 Registered trademark of the manufacturer

13.1.2 Brand

13.1.3 Model

13.1.4 Serial Number

13.1.5 Country of manufacture

13.2 Safety/precautionary markings shall be provided. Markings shall be stated in English or Filipino and shall be printed in red color with a white background.

13.3 The markings shall have a durable bond with the base surface material. The markings shall be water and heat resistant under normal cleaning procedures, it shall not fade, discolor, crack, peel and shall remain legible.

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