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Asian and Pacific Network for Testing of Agricultural Machinery

Regional Priorities for Safety, Standardization, and Test Procedure Development for Agricultural Sprayers, Chaff Cutters, Grain Threshers, and Crop Residue Management Machinery in the Asia-Pacific Region - 2025

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Introduction

- **Importance:** Mechanization is crucial for productivity, safety, and post-harvest efficiency.
- **Problem:** Inconsistent safety standards, limited testing protocols, and variable quality create risks.
- **Action:** ANTAM conducted a surveys based on the 11th Annual Meeting requirements.
- Requirements Identified
  - Requirements of test procedures for sprayers
  - Safety issues of chaff cutters
  - National priorities of developing test procedures for grain threshers
  - Identify machinery for crop residue management machinery
  - Available national standards for rice milling machines

Scope & Objectives

- Identify commonly used machinery types in the region
- Determine priority machinery for test code and procedures development under ANTAM TWG works
- Assess safety, quality, and environmental concerns of the member countries
- Collect existing national standards and regulations to build up a base for code development process
- Encourage member countries to participate in Technical Working Groups (TWGs)
- Recommend regional harmonization strategies

Feedbacks and Data Analysis

- Methodology: Structured questionnaires were circulated among ANTAM National Focal Points.
- Participation: Completed survey documents were received from 13 countries: Bhutan, Cambodia, Indonesia, Japan, Malaysia, Nepal, Philippines, Pakistan, Russia, Sri Lanka, Thailand, Uzbekistan, and Vietnam.
- Analysis: Responses were analyzed to identify common trends and consensus across the region, focusing on recurring issues, risks, and opportunities for harmonization.
- Outcome: The results reflect the collective perspective of ANTAM member countries and provide a regional consensus on priorities for machinery safety and testing.

Survey Findings: Agriculture Sprayers

	Sprayer Category	Level of Use
1	Manually operated backpack sprayers	High
2	Motorized knapsack sprayers	High
3	Battery-operated knapsack sprayers	High
4	Motorized mister-cum-dusters	Medium
5	Handheld knapsack sprayers	Low

- **Requirement for Test Procedures:**
- Improper calibration.
- Non-uniform spray distribution.
- Inadequate operator training.
- This can lead to both human health hazards and environmental contamination.

- Most member countries lack formal standards or regulations for sprayers.

Survey Findings: Chuff Cutters

- **Common Types Available:**
  Manual, motorized, and tractor-driven chaff cutters are all commonly used in the region, with the choice of type dependent on the scale of operation.
- **Safety Risks:**
  Operator's hands and arms, with cuts, lacerations, crush injuries, and even amputations reported in multiple countries. Eye injuries and electrical shocks are also concerns for certain machine types.
- **Training & Reporting:**
  Lack of safety features such as guards, emergency stop switches, and enclosed rotating components.
  Formal operator training is often absent.
  Accident reporting systems are weak or nonexistent.
  Users rely on informal learning from peers or family members, which limits awareness of safe operating practices.

Survey Findings: Grain Threshers

Common Grains: Rice, wheat, and maize.

Priority Types: Multi-crop threshers and **head-feeding rice threshers**.

Justification: High demand, wide use, and lack of consistent safety/performance testing.

Action: Harmonize test procedures based on existing ANTAM 004 and other national standards.

Crop Residue Management

Importance:

- Environmental, agricultural, and socio-economic implications.

Improper Management (Open-Field Burning):

- Air pollution, greenhouse gas emissions. soil degradation.

Benefits of Sustainable Practices:

- Improvement of soil health
- Water retention capacity
- Enabling of circular bioeconomy initiatives
- Promotion of long-term agricultural productivity

Survey Findings: Crop Residue Machinery

Largest Residue Production is in paddy, wheat, maize, and sugarcane cultivation.

Current Practices: combination of practices, including incorporation into soil, open field burning, and removal for use as fodder, bioenergy, or packaging materials.

Available Machines: Rotavators, Straw choppers/shredders, zero-till seed drills, Balers

Availability: Imported or fabricated locally

Some countries have the accessibility through custom hiring centers

Priorities for Harmonization / Test Procedures

- Test codes and Procedures for battery operated / Manual / Power Sprayers focusing environmental and operator's health.
- Test codes and procedures for manual / self – propelled / Tractor powered chuff cutters specially focusing operator safety.
- Test codes and procedures for Multi-crop threshers and head feeding type paddy threshers.
- Rotavators, Straw choppers/shredders, zero-till seed drills, Balers are the most common type of machinery used for crop residue management in the region.

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Thank you