Capacity Building of ANTAM Activities in 2017

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Centre for Sustainable Agricultural Mechanization

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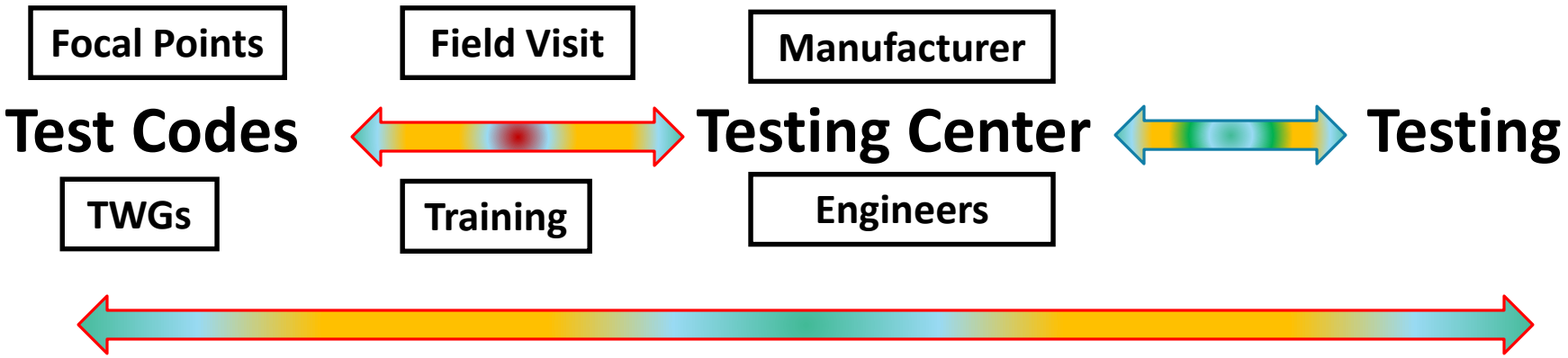
Capacity Building
ANTAM -2017

1. Training

2. Field Visit of Testing Centers

3. Round Robin Tests



Capacity Building - CSAM and ANTAM

CSAM Key Initiatives:

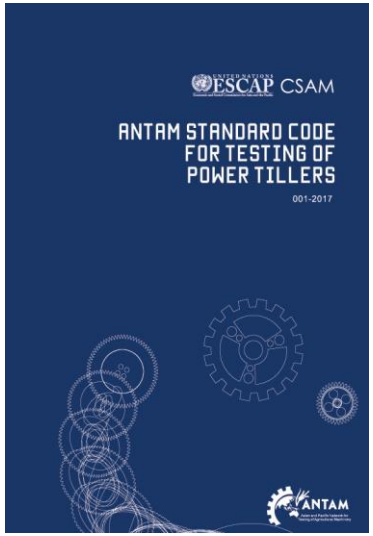
- Regional cooperation mechanism & networking : government agencies, testing stations, research & academic institutions, associations & private sector, & other key stakeholders
- Training, pilot projects, and technical assistance for innovative and sustainable practices and technologies

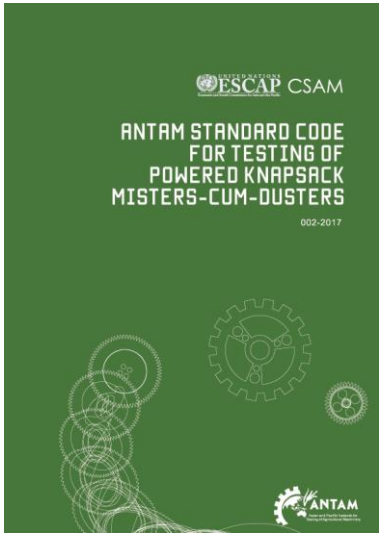
ANTAM Objective :

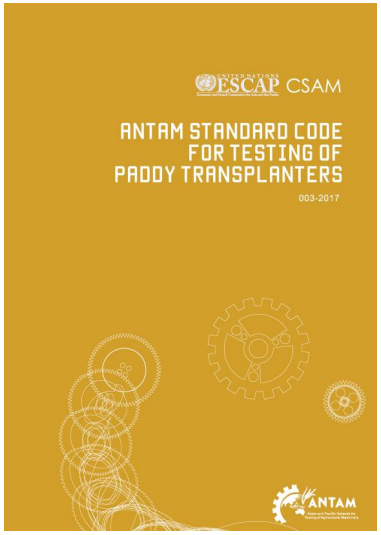
- ✓ Improve existing testing facilities of participating countries through capacity building programmes, seminars and site visits

1. The Training of Trainers - ANTAM Standard Codes

- Provide comprehensive knowledge of testing standards …. and
- Adopt the ANTAM Test Code for ANTAM testing stations





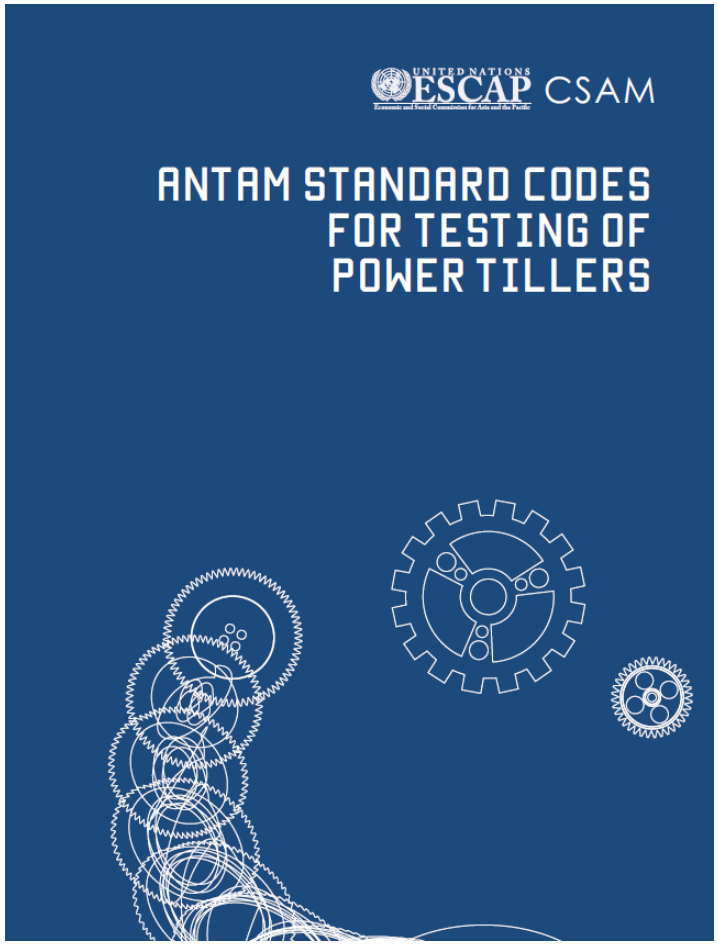


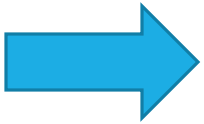
ANTAM Trainings 2016 – A Review

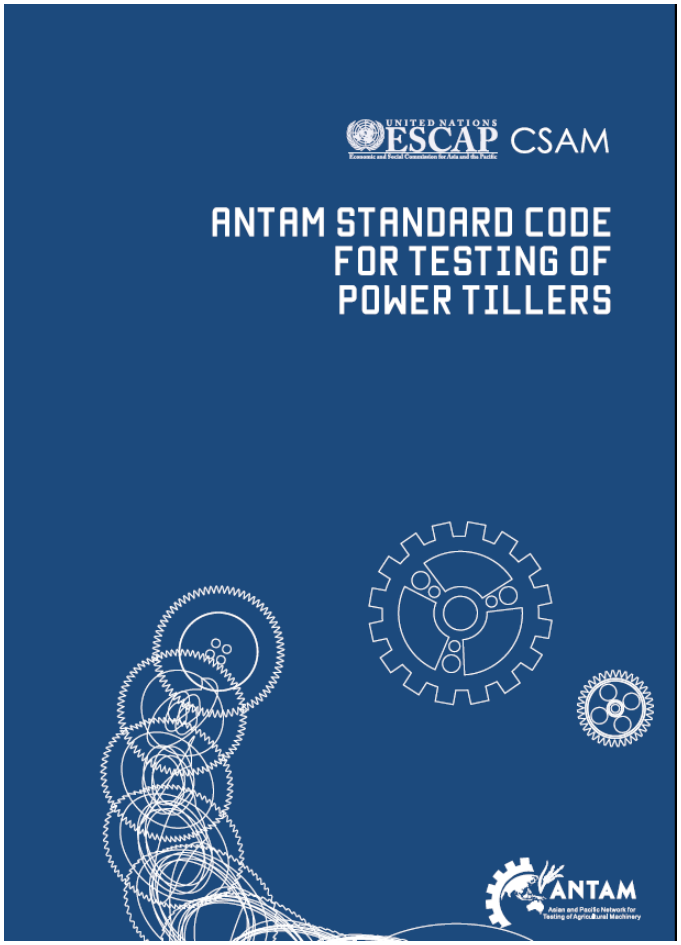
CSAM – CAMTC, China, 18-30 October 2016, 10 Days

20 participants, 12 countries divided into 2 groups :
Power Tiller & Power Knapsack Mister-Cum-Duster

1. Training – Power Tiller
ANTAM Test Codes 2015 & 2016
- Amendments of Test Codes







ANTAM Codes Power Tiller Training Manual 2015 & 2016

- ✓ 2015 Codes > 1st Training > 2016 New Codes – 3 additional tests > 2nd Training

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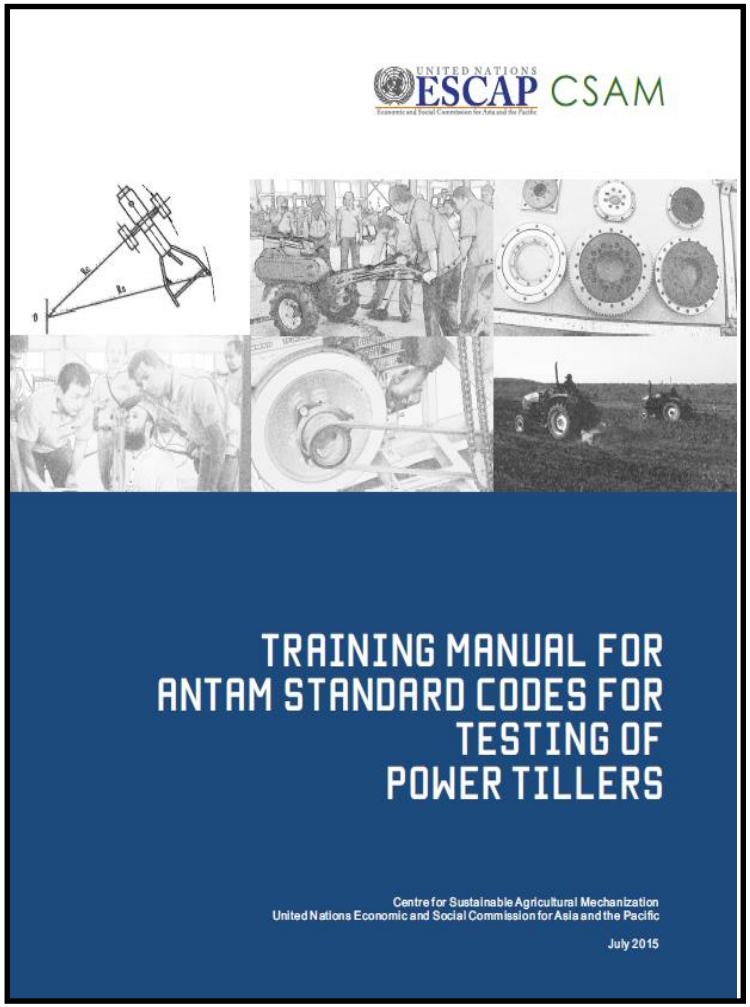
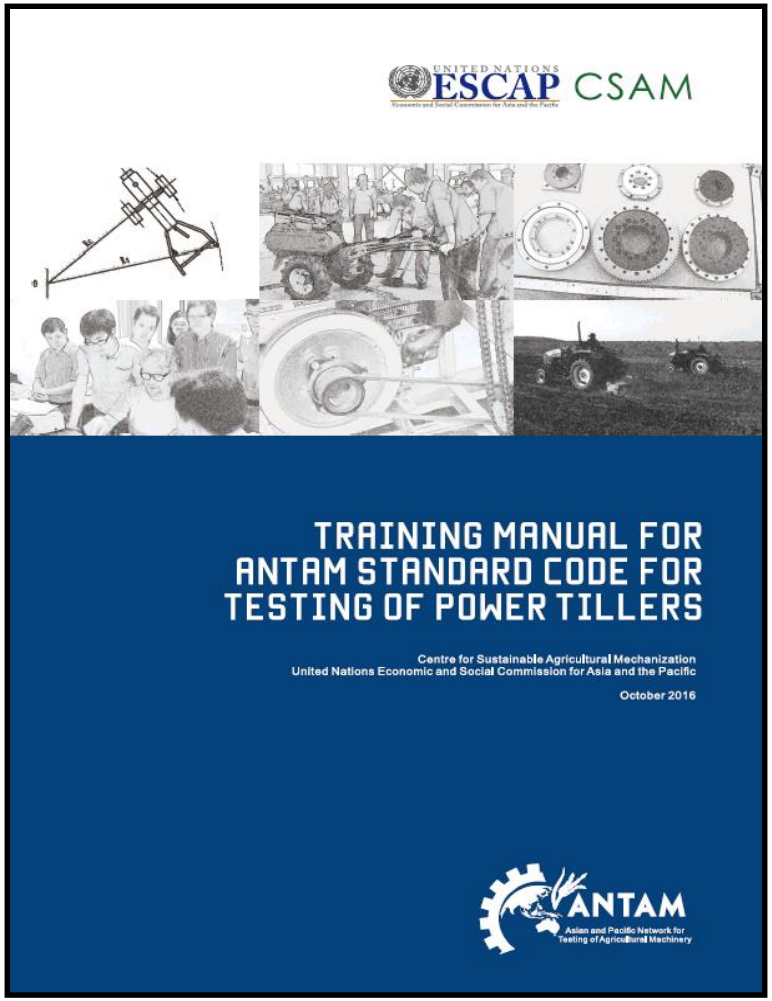
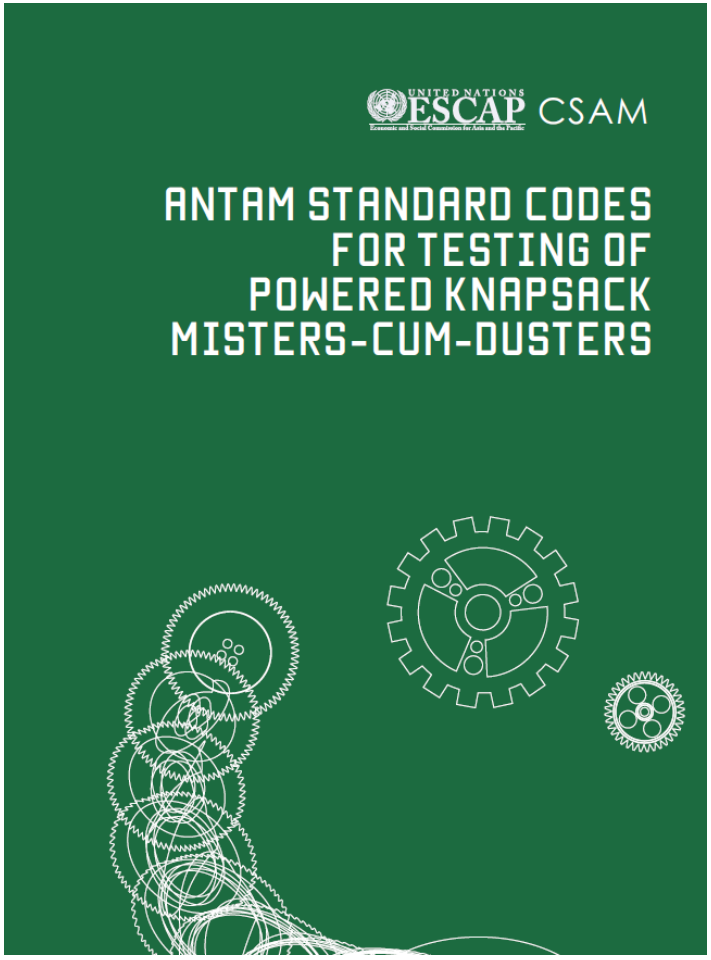
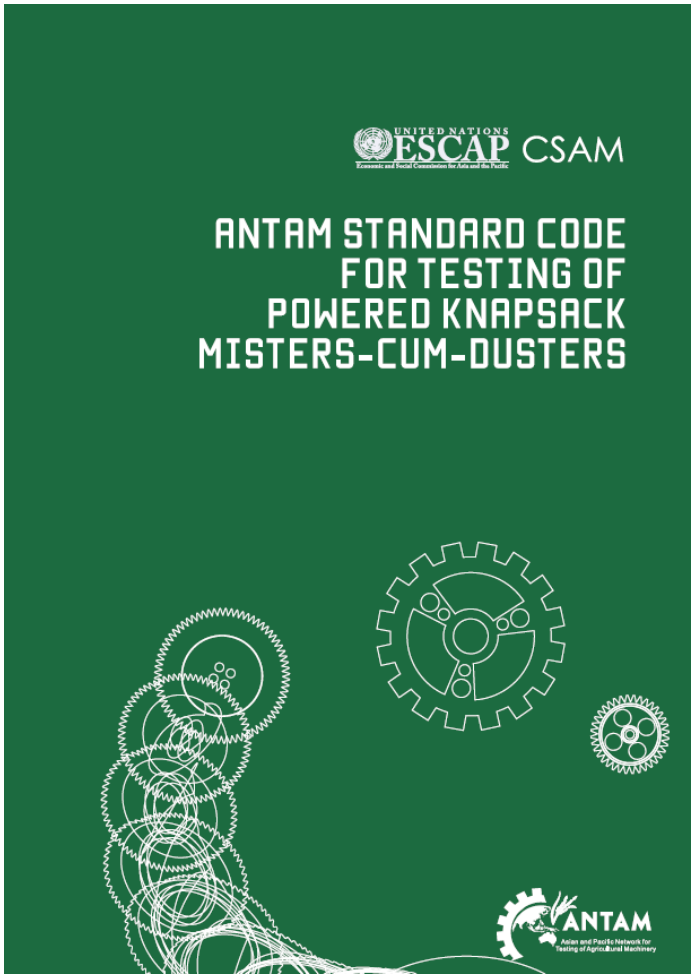
Training – Power Tiller
Training Manual 2015 & 2016





1. Training - Powered Knapsack Misters-Cum-Dusters ANTAM Codes 2015 & 2016
- Amendments of Test Codes





ANTAM - Powered Knapsack Misters-Cum-Dusters Training Manual 2015 & 2016

- Modified horizontal misting test to increase accuracy of the test results
- Enhanced monitoring of the environmental impact of the machine.
- Set max. weight limits on machine.
- Max. allowable sound levels, 95 dB(A) & manufacturers to provide ear protectors
- Test report

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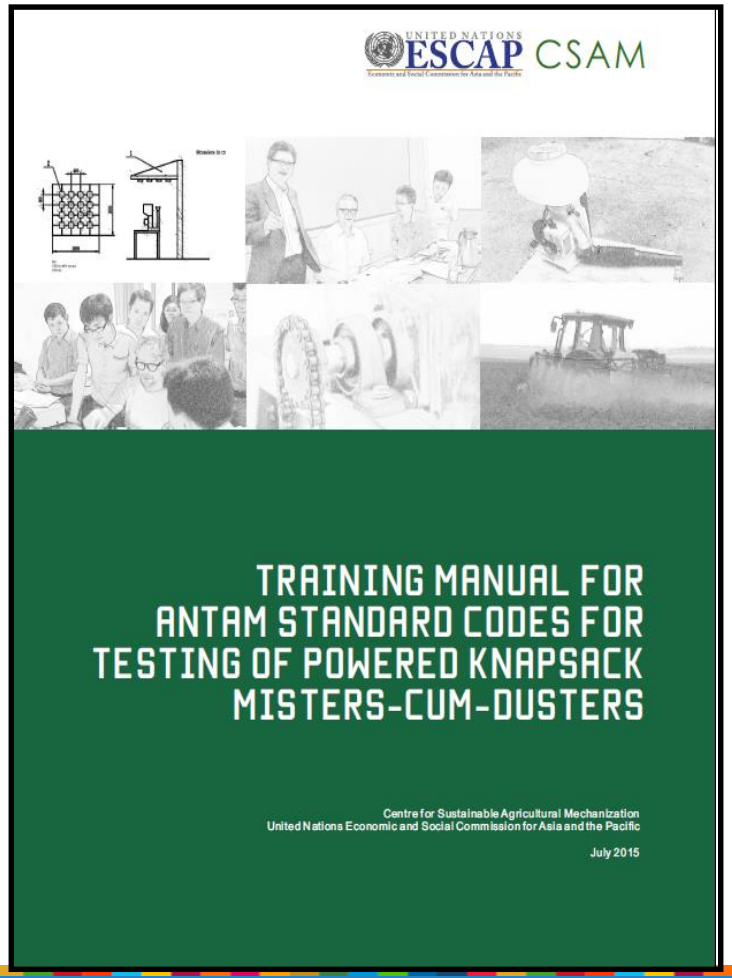
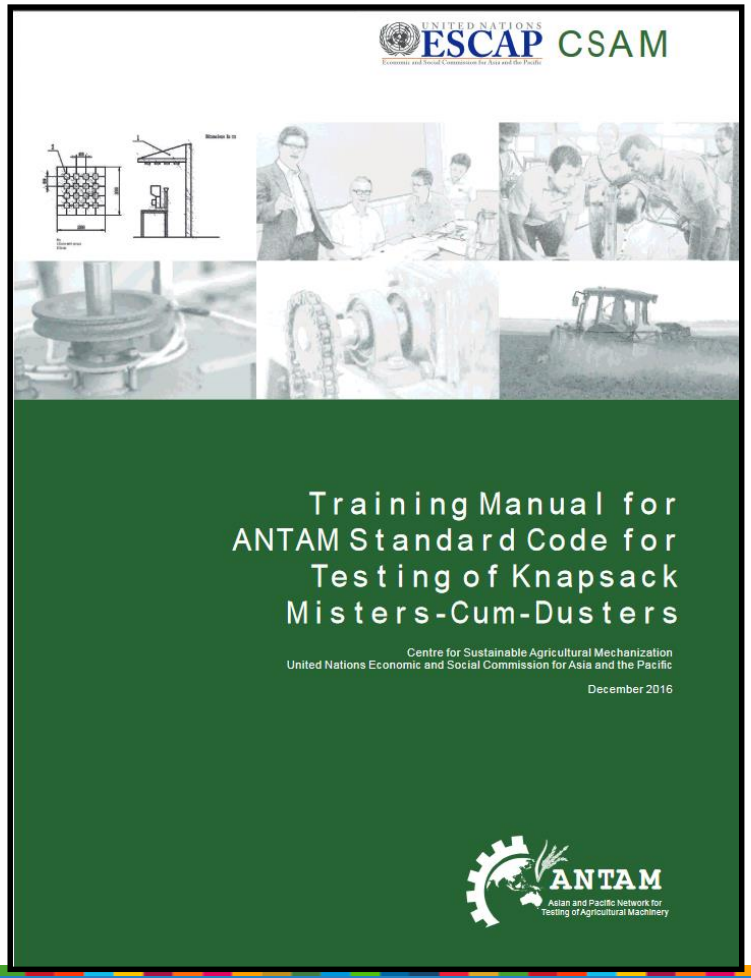
DURATION OF TESTS

No.	Particulars	Duration
A	GENERAL TEXTS	
1	Introduction	
B	CODES	
1	Specifications	
2	Materials	
3	Operator And Service Manual	
4	Submission Of Samples	
5	Measuring Tolerances	
6	Marking And Packing	
7	Workmanship And Finishing	
8	Specification For Performance	
9	Hose Accelerated Ageing Test	72 h
10	Chemical Tank Assembly Test	
11	Strap Drop Test	
12	Strap Absorbance Test	
13	Blower Air Velocity And Air Volume Test	
14	Fan Over-Speed Test	
15	Misting Discharge Rate (Full Tank And Various Tank Volumes) And Residues	
16	Dusting Discharge Rate (Full Tank And Various Tank Volumes) And Residues	
17	Misting Or Dusting Range And Width During Ground Deposition Test	
18	Vertical Deposition Test	
19	Droplet Size And Density Test	
20	General Noise And Ear Level Noise Tests	
21	Vibration Test	
22	Reliability And Endurance Test	50-100 h 120 h

Training - Powered Knapsack Misters-Cum-Dusters Training Manual 2015 & 2016

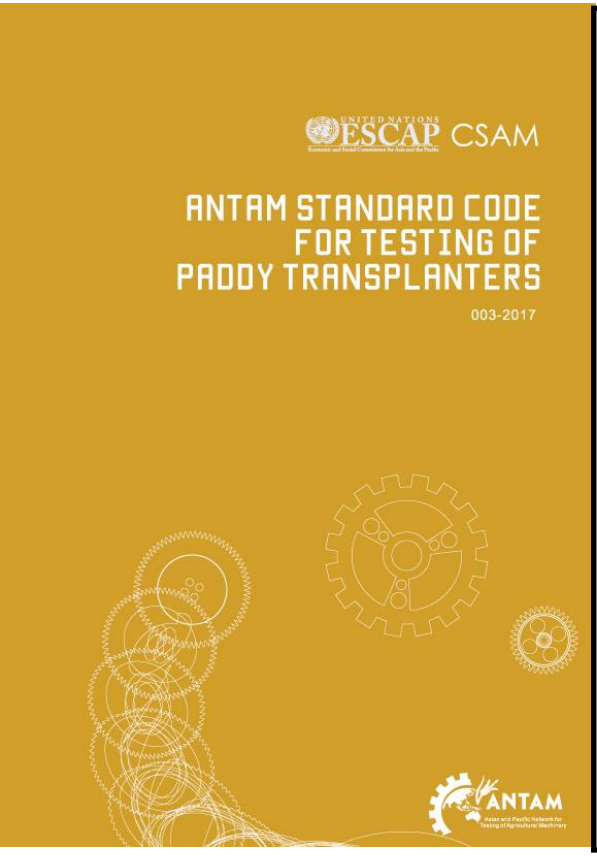


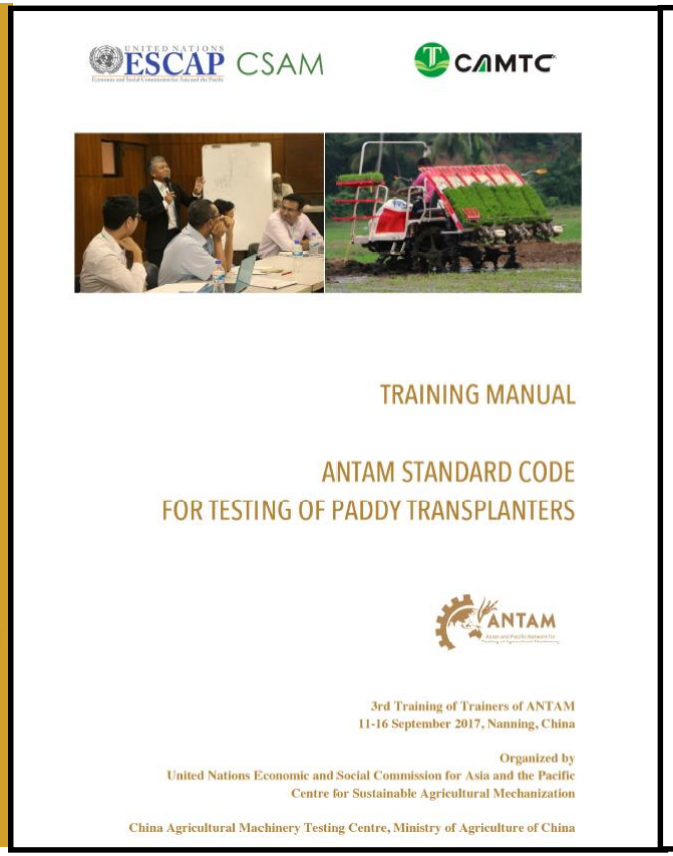


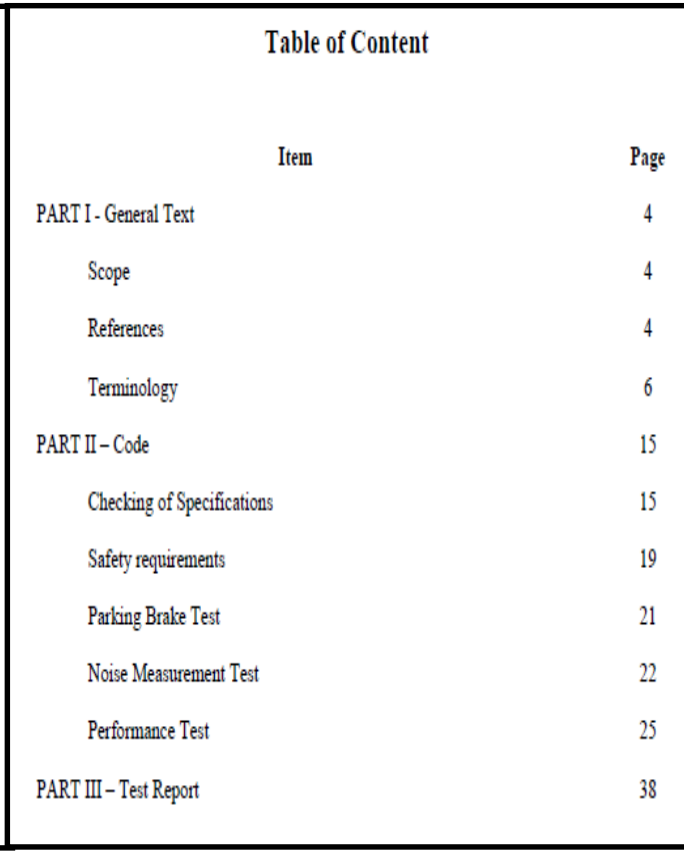
ANTAM Codes 003-2017 & Training Manual

Paddy Transplanters

- ✓ 2017 New Test Codes > 1st Training







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ANTAM Training 2017 (5 Days)

11-17 September 2017, 22 participants from 15 countries

Training of Trainers
Paddy Transplanter - ANTAM 003-2017
Program

Date	Time	Trainer	Module No.	Lecture No.	Items
9/11/2017 Mon	AM	Chan	1a	C-1	Introduction on Transplanting in Rice Production
		Zhang	1b	Z-1	Rice transplanter in China
		Ichiki	1c	I-1	Rice production in Japan
				I-2	Rice planter in Japan a) Seedling b) Field c) Machine
				I-3	New technology of trasplanter in Japan
		Chan	2	C-2	Schematic of Transplanter and parts
	PM	Chan	3	C-3	Test code and Test Standards
		Chan	4	C-4	Terminology, Submission of Sample
		Chan	5	C-5	Instrumentation, Test Rigs
9/12/2017 Tue	AM	Ichiki	6a	I-4	Technical operation on Transplanter
		Chan	6b	C-6	Checking on Specifications
		Chan	7	C-7	Safety Check
	PM	Chan	8	C-8	Parking Brake Test
		Chan	9	C-9	Noise test
		Chan	10	C-10	Field performance test - Pre- Planting
				C-11	Field performance test - During Planting
				I-12a	Field performance test - Post Planting Accuracy
				C-12b	Field performance test - Post Planting
		Chan	11	C-11	Test Report

Training of Trainers
Paddy Transplanter - ANTAM 003-2017
Program

Date	Time	Trainer	Site	Team *	Practical
9/14/2017 Thur	AM	Chan /Ms Ma	Co-OP	A	Checking on Specifications
		Zhang /Chan	Co-OP	B	Checking on Specifications
		Ichiki /Chan	Co-OP	C	Checking on Specifications
	PM	Chan /Ms Ma	Co-OP	A	Safety Check, Parking Brake Test, Noise test
		Zhang /Chan	Co-OP	B	Safety Check, Parking Brake Test, Noise test
		Ichiki /Chan	Co-OP	C	Safety Check, Parking Brake Test, Noise test
9/15/2017 Fri	AM & PM	Chan /Ms Ma	Field	A	Field data collection - Pre- Planting
		Zhang /Chan	Field	B	Field data collection - Pre- Planting
		Ichiki /Chan	Field	C	Field data collection - Pre- Planting
9/16/2017 Sat	AM	Chan /Ms Ma	Field	A	Field performance data collection during Planting
		Zhang /Chan	Field	B	Field performance data collection during Planting
		Ichiki /Chan	Field	C	Field performance data collection during Planting
		Chan /Ms Ma	Field	A	Field performance data collection Post Planting
		Zhang /Chan	Field	B	Field performance data collection Post Planting
		Ichiki /Chan	Field	C	Field performance data collection Post Planting
	PM	Chan /Ms Ma	Field	A	Test Report
		Zhang /Chan	Field	B	Test Report
		Ichiki /Chan	Field	C	Test Report

Training of Trainers
Paddy Transplanter - ANTAM 003-2017
Profile of Trainee

Education	Years of Experience	Distribution of experiences
PhD (4)	5 - 21	> 20 yrs = 3
Master (8)	5 - 20	10 to 20 years = 6
BE or B.Sc (9)	1 - 20	5 to < 10 years = 6 < 5 years = 3

Training of Trainers

Paddy Transplanter - ANTAM 003-2017

Feedbacks from Member Countries (22 feedbacks, Rank : 1 – 5)

	5 (Strong) %	4 (Moderate) %	3 (Slightly) %
Objectives	**82**	**22**	**-**
Overall quality	**54**	**46**	**-**
Usefulness - Lectures	**50**	**45**	**5**
Good platform on info. sharing	**95**	**5**	**-**
Program	**59**	**41**	**-**
Duration	**45**	**41**	**14**
Capacity Improved	**73**	**27**	**-**
Learned ANTAM Codes	**91**	**9**	**-**

- **Benefits** (22): Better understanding of conditions in other countries, networking
- **ANTAM** (13): Realized challenges in harmonizing ANTAM codes, more trainings per year
- **Program** (12): Need longer duration, long distance between lectures and fields, involve manufacturer

Training of Trainers
Paddy Transplanter - ANTAM 003-2017
Implications on Test Codes & Testing Center

1. **Test Procedures**: Replications > adaptations & time, harmonizing standards, scientific evidences
2. **Technical Specifications** : adjustments on test codes
3. **Field Conditions** : size, configurations, locality and quantity
4. **Testing Facilities**: Choice and availability, eg. Lab., slope ramp
5. **Test Instrumentations**: Choice and accuracy requirements
6. **Human Resources** : skills and needs

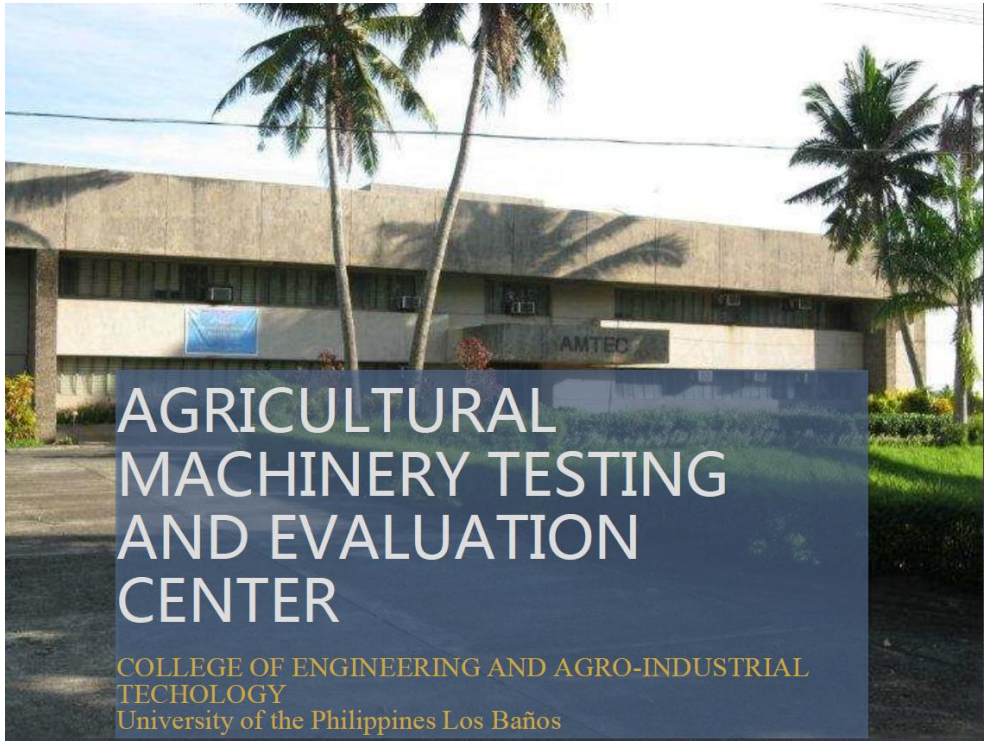
- Manufacturer's Concern : certification and documentary supports

2. Testing Centers Field Visits

- Selected : Based on the information collected and other strategic programmatic priorities
- 3 Testing Centers:
  - ✓ AMTEC, Los Banos, Philippines
  - ✓ NRIAM , Nanjing, China
  - ✓ CAMTC, Beijing, China
- Physical facilities, testing equipment and instrumentation, testing services, testing quality control, test reports, human resources and organization, funding mechanism, capacity analysis
- Functional capability, accuracy, calibration and scores

ANTAM Field Visits

- ✓ AMTEC, Los Banos, Philippines



ANTAM Field Visits

- ✓ NRIAM, Nanjing, China.

Testing Center Field Visits

- ✓ CAMTC, Beijing, China

Testing Centers Field Visits ANTAM

List of ANTAM 001-2017 Tests for Power Tiller

No.	Name of test
1	Specification
2	Engine performance test
3	Rotary shaft performance test
4	Vibration measurement test
5	Drawbar performance test
6	Turning ability measurement
7	Parking brake test
8	Noise measurements
9	Waterproof test

Testing Centers Field Visits ANTAM

List of ANTAM 001-2017 Physical Facilities

No	Test Facilities	Test No.	Use
1	Slope ramp for parking brake test	7	Parking brake test
2	Water proof test bed	9	Water proof test
3	Concrete test track	5 and 6	Drawbar test
4	Test laboratories	1, 2, 3 and 4	Laboratory tests
5	Workshop	All	Support services

Testing Centers Field Visits ANTAM

List of ANTAM 001-2017 Test Rigs

No	Test Rigs	Test No.	Use
1	Weighing balance to measure the weight of power tiller	1	Measuring weight of power tiller
2	Dynamometer for Engine Test	2	Power measurement
3	Control System for Engine Test	2	Control of system
4	Adapters for rotary shaft test	3	Rotary shaft test

List of ANTAM 001-2017 Tests Instrumentation

No	Test Instrument	Test No.	Accuracy (% F.S.)	Notes
1	Tachometer, (rev/min)	As needed	± 0.5	Rotation speed
2	Fuel flow meter, (kg)	As needed	± 1.0	Fuel consumption
3	Digital stopwatch, (s)	As needed	± 0.2	Time
4	Tyre Pressure Gauge, (kPa)	As needed	± 5.0	Tyre pressure
5	Accelerometer, (%)	As needed	± 1.0	Vibration measurement complete with a metal clamp
6	Weighing balance, (kg)	As needed	±0.5	Weight
7	Noise variation, dB (A)	As needed	±0.5	Sound level meter
8	Atmospheric pressure, (kPa)	As needed	± 0.2 kPa	Air pressure
9	Anemometer, (m s^{-1})	As needed	± 5% FS	Wind speed
10	Thermometer, (^{0} C)	As needed	± 0.5 ^{0}C	Temperature
11	Hygrometer, (% FS)		± 0.5%	Relative Humidity
14	Mesuring tape (30 m), (m)	As needed	0.01 m	Distance
	Mesuring tape (5m), (m)	As needed	0.01 m	Distance
15	Comprehensive computer software for drawbar test	As needed	N.A	Drawbar test
16	Laptop for drawbar test	As needed	N.A	Drawbar test
17	Force sensor with steel cable link	As needed	± 0.5% (1mT F.S.)	Drawbar test
18	Force sensor on a 5th wheel	As needed	± 0.5% 170P/R	Drawbar test

List of ANTAM 002-2017 Tests for Powered Knapsack Misters- Cum-Dusters

No.	Name of test
1	Specification inspections and stability test
2	Workmanship and finishing test (paint work)
3	Hose accelerated ageing test
4	Chemical tank assembly test
5	Strap drop test
6	Straps absorbance test
7	Blower air velocity
8	Air volume test
9	Fan over-speed test
10	Misting discharge rate and residues
11	Dusting discharge rate and residues
12	Misting or dusting range and width during ground deposition test
13	Vertical deposition test (Mister only)
14	Measurement of droplet size and droplet density (Mister only)
15	General Noise and ear level noise tests
16	Vibration test
17	Reliability and endurance test

Testing Centers Field Visits ANTAM

List of ANTAM 002-2017 Physical Facilities

No	Test Facilities	Test No.	Notes
1	Test facility for misting range, width and droplets	10, 11, 12 and 14	
2	Vertical deposition test facility	13	
3	Test laboratories	All	
4.	Workshop	All	Support services

Testing Centers Field Visits ANTAM

List of ANTAM 002-2017 Test Rigs

No	Test Rigs	Test No.	Notes
1	Test rig used to fix the mister cum duster for blower test, misting or dusting range and noise test	10, 11, 12 and 14	
2	Test rig used for the strap drop test	5	
3	Test rig for fan overspeed test with control room and system	9	
4	Aging box	3	Stove, ± 1°C
5	Test rig for blower test acc. ANSI 172.5 Balance 5kg range	1	± 10g
6	Test bench for strap absorption test	6	

List of ANTAM 002-2017 Tests Instrumentation

No	Test Instrument	Test No.	Accuracy (%)	Notes
1	Tachometer, (rev/min)	As needed	± 0.5	Rotation speed
2	Anemometer, (m/s)	As needed	± 0.1	Air flow. Portable anemometer or Pitot sensor
3	Digital stopwatch, (s)	As needed	± 1	Time
4	Sound level meter, dB (A)	As needed	± 0.5	Noise
5	Accelerometer, (%)	As needed	± 10	Vibration
6	Weighing balance, (kg)	As needed	± 0.05	Weight
7	Weighing balance, (g)	As needed	± 0.05	Weight
8	Pressure meter, kPa	As needed	± 1 % Full scale (< 10 kPa)	Pressure
9	Anemometer, (m s^{-1})	As needed	± 5% FS	Wind speed
10	Thermometer, (^{0} C)	As needed	± 1 ^{0}C	Temperature
11	Hygrometer, (% FS)		± 1%	Relative Humidity
12	Digital coating thickness gauge	As needed	2 µm ± 3%	Paint layer thickness
13	Vernier caliper, (mm)	As needed	0.1 mm	Distance
14	Measuring tape, (m)	As needed	0.01 m	Distance
15	Strength of material testing (N)	As needed	1 N	Strength of material

Testing Centers Field Visits by ANTAM

List of ANTAM 003-2017 Tests for Paddy Transplanters

No.	Name of test
1	Specification
2	Safety test
3	Parking brake test
4	Noise measurements
5	Field performance tests

Testing Centers Field Visits by ANTAM

List of ANTAM 003-2017 Physical Facilities

No	Test Facilities	Test No.	Use
1	Slope ramp for parking brake test	3	Parking brake test
2	Test laboratories	1, 2 and 4	Laboratory tests
3	Paddy field plots	5	Field tests
4	Workshop	All	Support services

Testing Centers Field Visits by ANTAM

List of ANTAM 003-2017 Test Rigs

No	Test Rigs	Test No.	Use
1	Weighing balance to measure the weight of power tiller	1	Measuring weight of transplanter
2	Test rig for noise measurement	4	Noise measurement

List of ANTAM 003-2017 Tests Instrumentation

No	Test items	Test No.	Accuracy (% F.S.)	Notes
1	Rotational speed, rev/min	As needed	± 0.5	Tachometer
2	Time variation, s	As needed	±1	Digital stopwatch
3	Noise variation, dB (A)	As needed	±0.5	Sound level meter
4	Cone drop	As needed	45 degree, 135 gm	Soil surface hardness measurement
5	Cone penetrometer	As needed		Soil hardpan measurement
6	Angle meter, degree	As needed	± 1 degree	Angle meter
7	Temperature, ^{0} C	As needed	± 1 ^{0}C	Thermometer
8	Relative Humidity, % FS		± 1%	Hygrometer
9	Area, m ^{2}	As needed		Area measurement
10	Distance, mm	As needed	0.1 mm	Vernier caliper
11	Distance, m	As needed	0.01m	Measuring tape
12	Distance, m	As needed	0.01m	Measuring tape, 0.01m

2. Testing Centers Field Visits by ANTAM
ANTAM 001 and 002- 2017
Implications on Testing Center

1. **Test Procedures**: Compliance
2. **Testing Physical Facilities**: requirements
3. **Field Conditions** : size, configurations, locality and quantity
4. **Testing Equipment**: Choice, availability and supporting lab.: Eg. Fabrication Lab., slope ramp, etc
5. **Test Instrumentations**: Choice, accuracy and calibration requirements
6. **Quality Control & Test Reporting :** Quality control mechanism
7. **Human Resources** : skills and needs

- Concern : Finance

3. Round Robin Test
ANTAM 2017 - Preliminary Observation

- ✓ Inter-laboratory test / Round-robin test : Independent tests, identical machine, different testing stations
- ✓ Compare discrepancies in results
- ✓ Provide information on the testing capacities of testing stations
- ✓ 6 ANTAM participating countries : China, France, Malaysia, Philippines, Sri Lanka and Turkey.

Round Robin Test - Some sample Reports

- **Issue cause by Manufacturer details ?**
- **Measurement method ?**

- **Lack of clear definition on parts ?**

SPECIFICATIONS CHECK:

- Numbering of items in test report –not consistent
- Varying measurements on Dimensions : varies by 1m – typo error ?,
- No engine test certification
- Inconsistent report on Serial Number
- Incomplete engine setting details (due to manufacturer's information)
- Inconsistent descriptions on parts: Fuel type, fuel filter, materials (plastic vs PE), shape, enclosure (fully vs partially), diameter (varied by 55mm), blade (forward vs radial bent),
- No fuel tank capacity value
- Noise test incomplete
- Inconsistent data: tank capacity (varied by 2.5 l), etc, tank level, extra volume of 5%,

Round Robin Test ANTAM

INSTRUMENTATION/EQUIPMENT

- Purpose of equipment : Wrong information detailed
- Accuracy descriptions : Inconsistent
- Model used : Incomplete

Round Robin Test ANTAM

COMPONENT TEST RESULTS

- Liquid and dust – not specified in Test Report
- Not indicating result though pass. Must indicate
- No accelerated aging test

PERFORMANCE TEST

- Inconsistent reporting on test results – must state data on items involving pass/fail on performance specification
- C.V. Pass vs Fail (no data given but range)
- Incomplete results/test on : vertical misting and dusting , fan air volume

SAFETY AND ENDURANCE

- Noise test: pas vs fail
- No MTTFF tests
- Not indicating result though pass. Must indicate
- Good presentations on graphs and data
- No Conclusion nor recommendation