ICAR-Central Institute Of Agricultural Engineering, Bhopal

An Overview

An ISO 9001-2015 Certified Institution

Dr. M. Din,
Director

Dr. Nandede Balaji, Scientist

Central Institute of Agricultural Engineering
Nabibag, Berasia Road, Bhopal- 462038, MP

Indian Agriculture

- Net sown area - 140 million ha (42.6%)
- Agricultural workers - 263 million
- Employs about 52% of the work force
- Provides livelihood to about 58% of the population
- Contributes 14% to the Gross Domestic Product (GDP)
- Yearly production
  - Food grains – 272 million tonne (2016-17)
  - Pulses – 22.14 million tonne (2016-17)
  - Horticultural produce – 286 million tonne (2015-16)
- No. of land holdings – 138 million

MANDATE OF THE INSTITUTE

- Research on agricultural mechanization, post-harvest food processing, and energy management in agriculture.

- Human resource development and capacity building through outreach and training programs; commercialization and utilization of agricultural engineering technologies.

ICAR-Central Institute of Agricultural Engineering (CIAE), Bhopal

- Agricultural Mechanization Div
- Agro-produce processing Div
- Agricultural Energy & Power Div
- Irrigation & Drainage Engineering Div
- Technology Transfer Div

CIAE Regional Centre, Coimbatore

- **All India Coordinated Research Projects (AICRP) on**:
  - Farm Implements and Machinery (FIM)
  - Energy in Agriculture and Agro-based Industries (EAAI)
  - Utilization of Animal Energy (UAE)
  - Ergonomics and Safety in Agriculture (ESA)
- **Consortia Research Platforms (CRP) on**:
  - Farm Mechanization and Precision Farming (FM&PF)
  - Energy from Agriculture (EA)
- **Network Project on:**
  - Network Project on Engineering Interventions in Micro Irrigation Systems for Improving Water Productivity

Quality Control Systems in India

Dr. M.Din

Dr. Nandede Balaji

ICAR-Central Institute of Agricultural Engineering

Bhopal, Madhya Pradesh, India

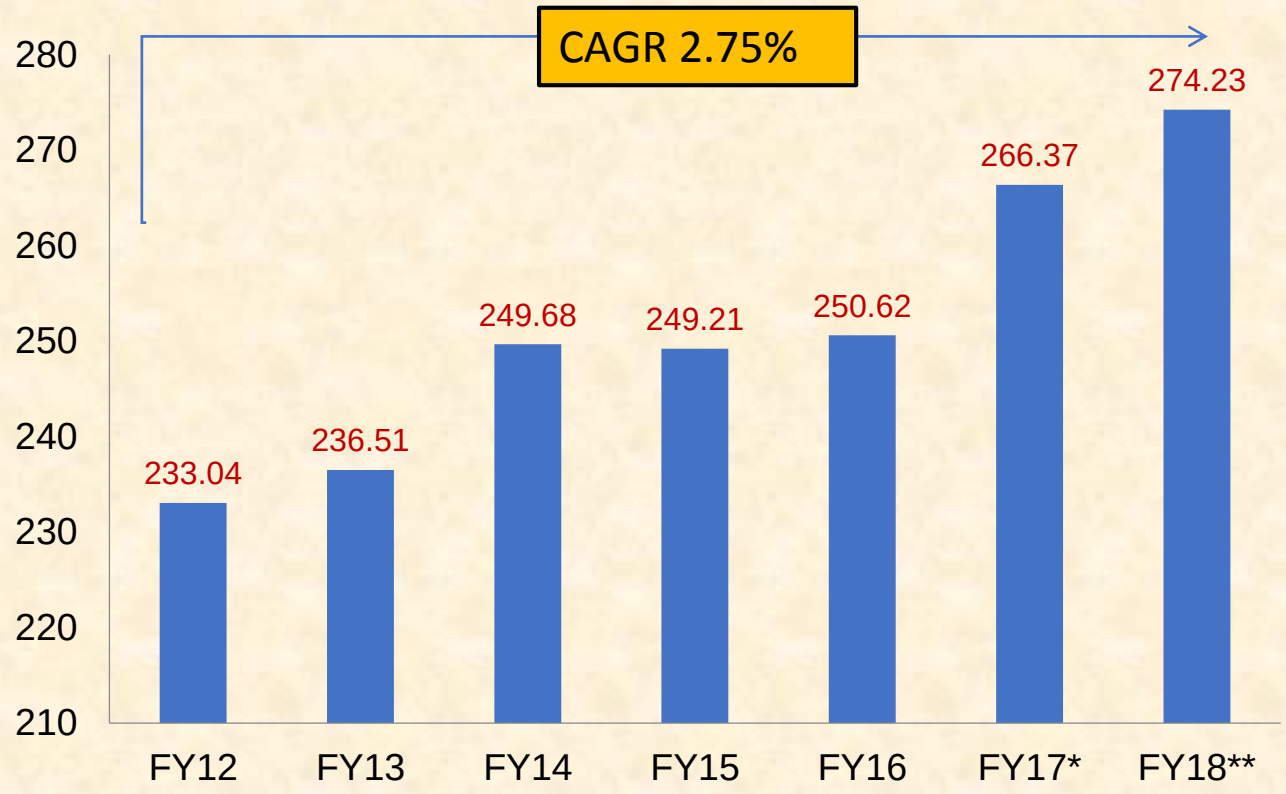
5th Training of Trainers of the Asian and Pacific Network for Testing of Agricultural Machinery

September 04-11, 2019 Beijing, Changsha and China

Agriculture in India: Information About Indian Agriculture & Its Importance

- Agriculture is the primary source of livelihood for about 58 per cent of India's population.
- Gross Value Added by agriculture, forestry and fishing is estimated at Rs 17.67 trillion (US$ 274.23 billion) in FY18*.
- Agriculture and allied sector's GVA at constant 2011-12 prices grew a CAGR of 2.75 per cent between FY12-18.
- As per Union Budget 2018-19, allocation of Rs 57,600 crore (US$ 8.9 billion) was made for The Agriculture Ministry.

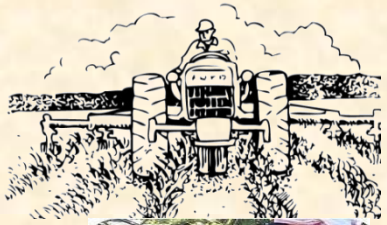
Gross value added by Agriculture and allied sectors (US$ billion) at constant 2011-12 prices



Notes: GDP – Gross Domestic Product, MOSPI – Ministry of Statistics and Programme Implementation, * 1st revised estimates, ** 2nd advance estimates
Source: Ministry of Agriculture, Print Release, RBI, Aranca Research, MOSPI, Central Statistics Office (CSO)

Status of Farm Mechanisation In India

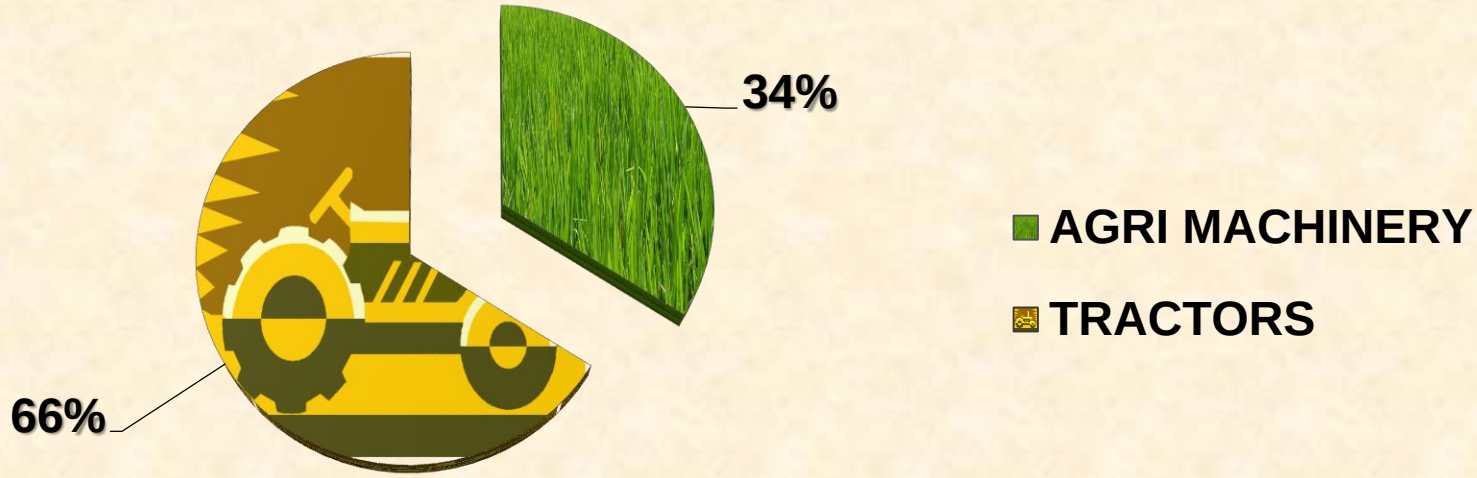
Overview of farm equipment



Equipment & Tool Segment	Key Tools
Power operated equipment & tools	Tractors, combine harvester, cultivator, power chaff cutter, power engine/pumps, power reaper, power sprayer etc.
Hand operated equipment & tools	Manual sprayers, hand seed driller, pedal operated thresher, winnowing fan, chaff cutter, blade hoe, cono weeder, etc.
Animal operated equipment & tools	Wooden plough, disc harrow, seed-cum fertiliser drill, bullock cart, cane crusher, etc..
Other equipment	Sprinklers used for irrigation and drip irrigation sets

Indian Agricultural Machinery Industry

- 250 Medium to Large Scale Units
- 2,500 Small Scale Industries
- 15,000 Tiny Industries
- 1,00,000 Village level Artisans
- 32,000 Crore Industry, CAGR growth 5%



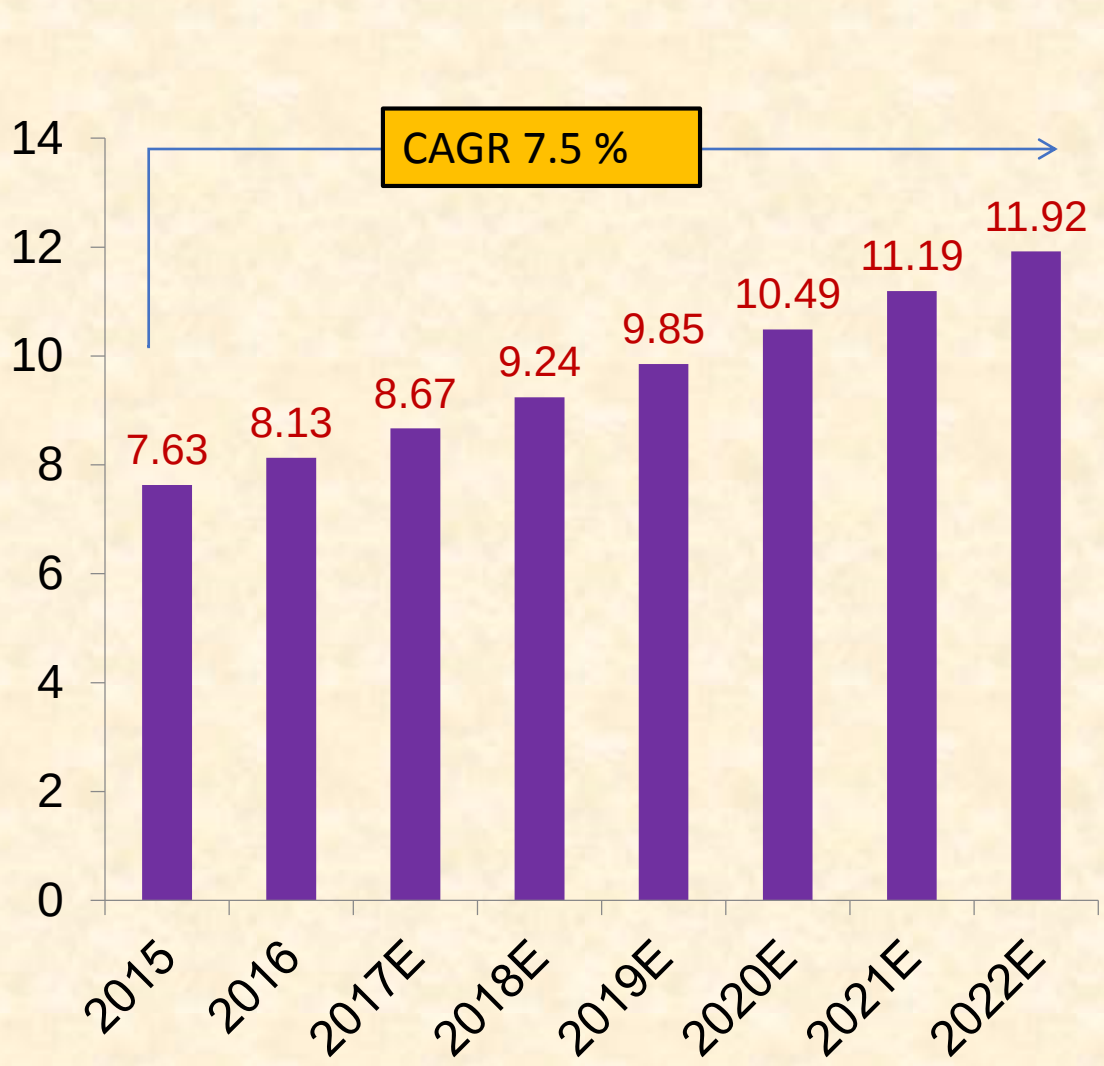
Manufacturing Units in India

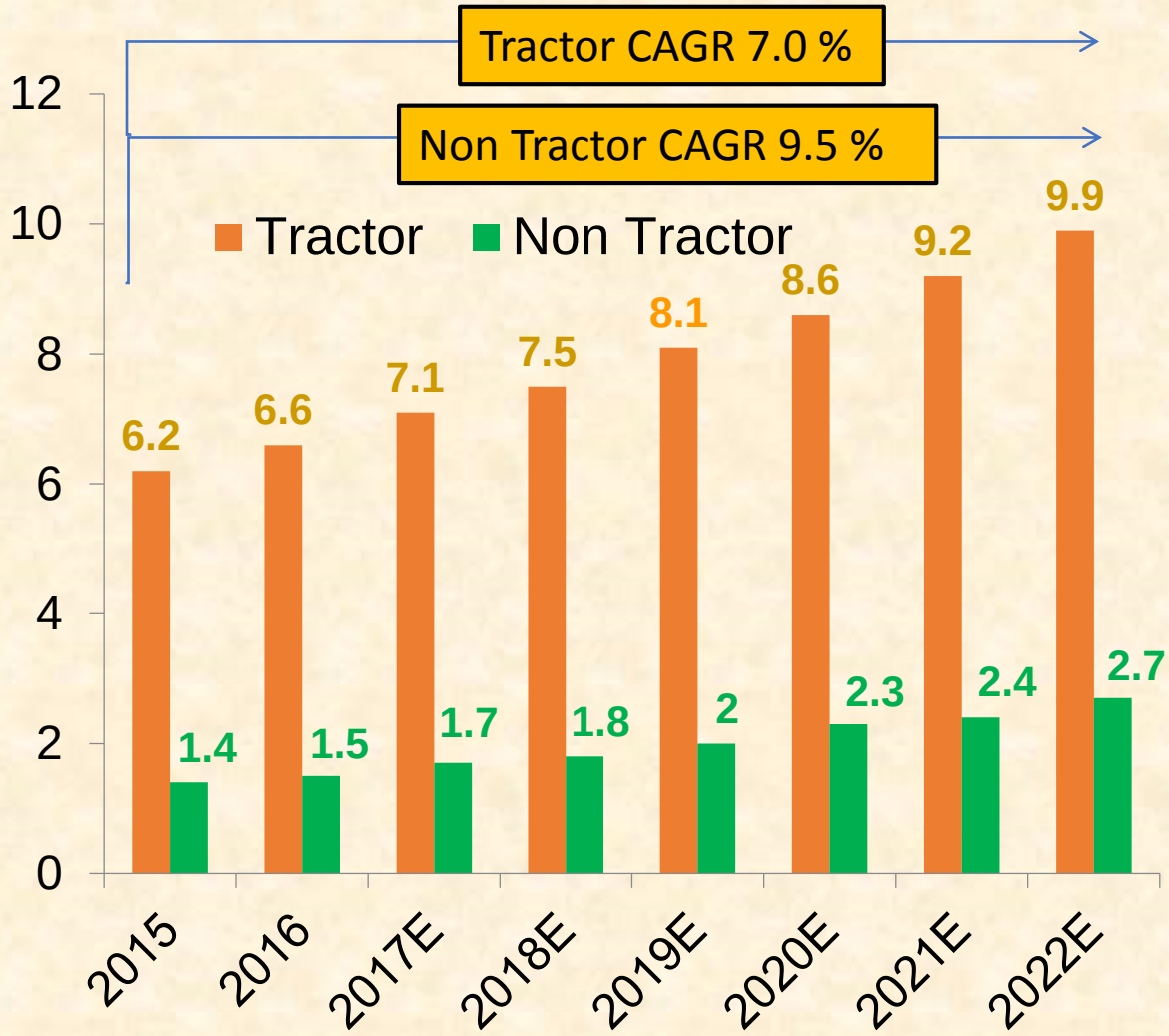
Equipment manufacturers	No. of units
• Agricultural tractors	21
• Power tillers	7
• Irrigation pumps	600
• Plant protection equipment	300
• Combine Harvester	48
• Reapers	60
• Threshers	6000
• Seed Drills and planters	2500
• Diesel oil engines	200
• Plough, cultivators, harrows	5000
• Chaff cutter	50
• Rural artisans (hand tools)	>1 million

Source: AMMA, India

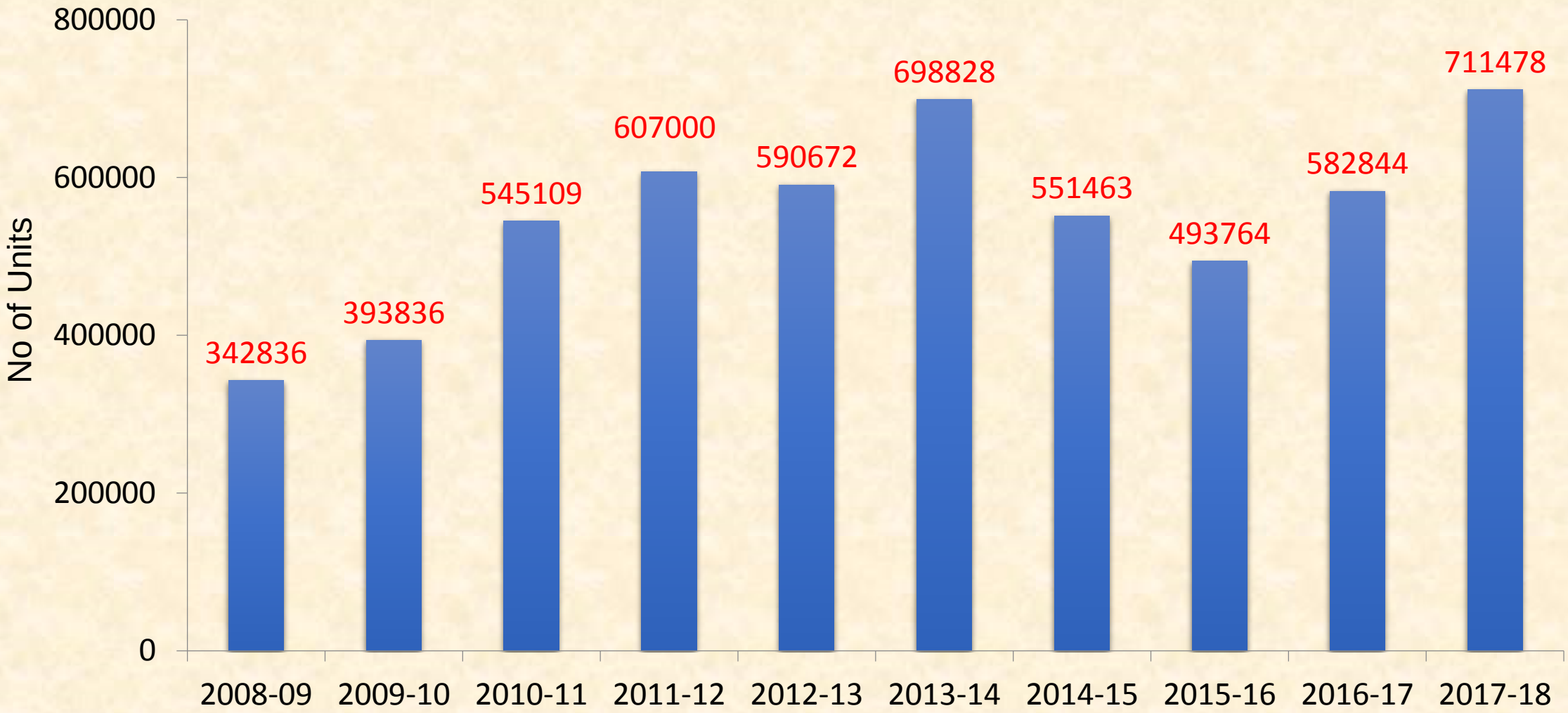
Market Size and Segmentation

Farm Equipment Market in India (USD bn)



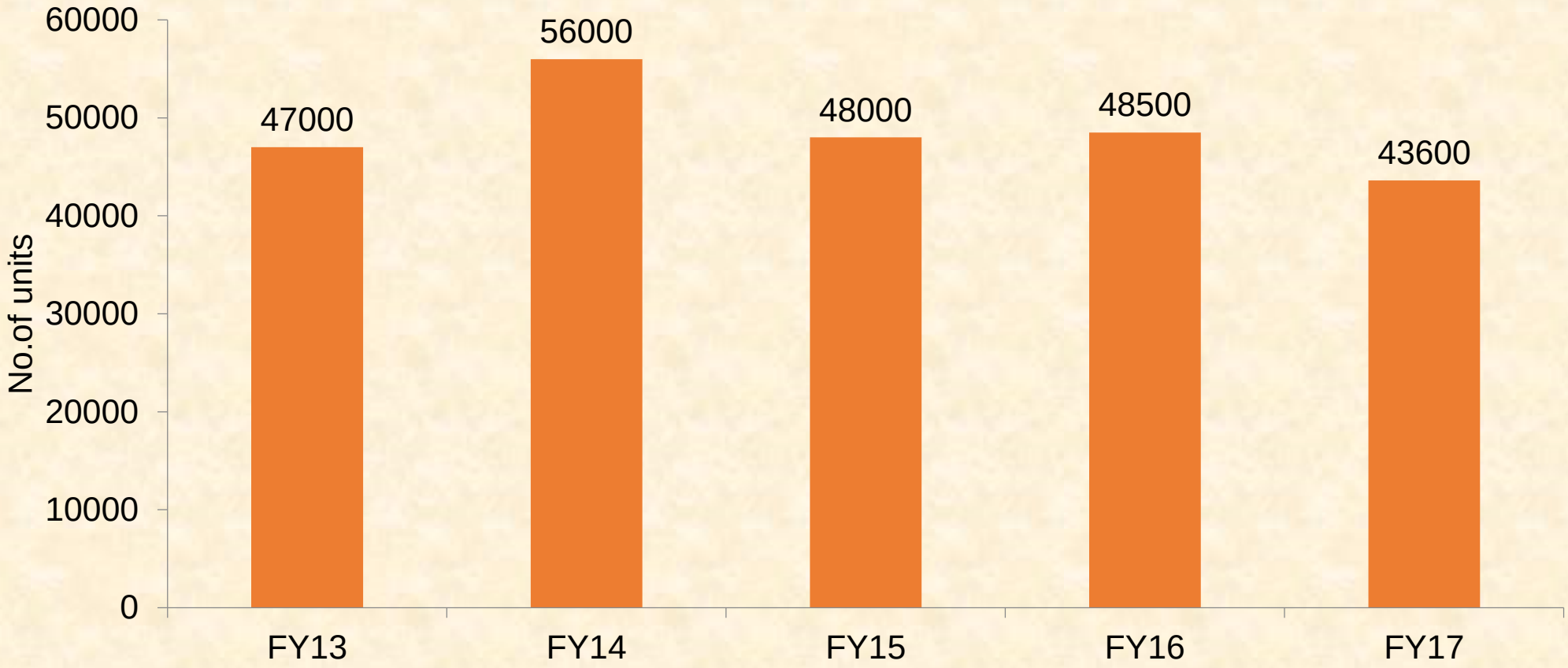


Tractor Domestic Sale



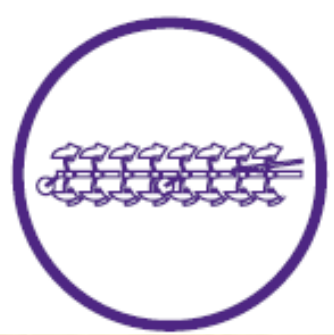
Source: TMA, India

Power Tiller Market In India



Source: Company, ICICIdirect.com Research

Market Share (In Number Unit) of Non Tractor Unit



3.7 %
Rotavator

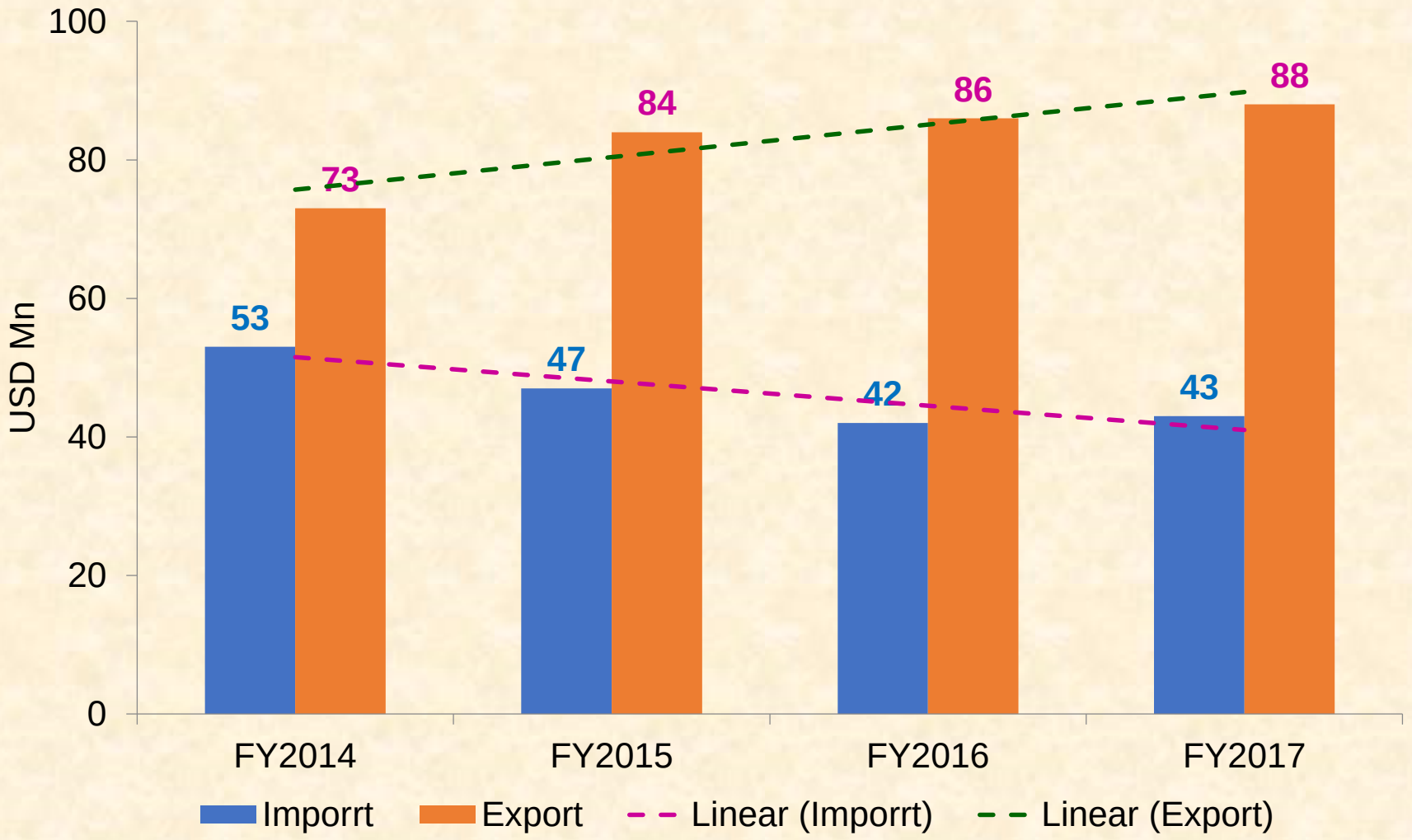
2.5 %
Thresher

1.4 %
Power Tiller

11.0 %
Others

- Harvester market in India is expected to grow at a CAGR of 14 per cent during the forecast period of 2015-2022.
- Power tiller market which is expected to grow at a CAGR of 9.5 per cent during 2015-2022.

Import and Export of Agricultural Machinery



National Testing Codes

- The Indian Standards Institution (ISI) came into being on the 06 January 1947

- Bureau of Indian standards (BIS) came into existence, on 1 April 1987, with a broadened scope and more powers taking over the staff, assets, liabilities and functions of erstwhile ISI.

Sl No	Category	No of test codes
1	Tractor	66
2	Power tiller	10
3	Primary tillage equipment	16
4	Secondary tillage equipment	22
5	Sowing and planting equipment	29
6	Intercultural and weeding equipment	11
7	Harvesting equipment	21
8	Threshing equipment	18
9	Crop protection equipment	18
10	Powered lawn and garden	11
11	Ergonomics and agricultural safety	03
12	Other relevant standards	12
	Total	237

Testing of Agricultural Machinery in India

Location of FMTTI'S

Northern Region Farm Machinery Training and Testing Institute Hissar (1963)

North-Eastern Region Farm Machinery Training and Testing Institute, Biswanath-Chariali (1990)

Central Farm Machinery Training and Testing Institute Budni (1956)

Southern Region Farm Machinery Training and Testing Institute, Garladinne, Anantpur (1983)

Strengthening Machinery Testing Facility

- Many implements/Machines require lots of time and land requirement

Sl. No.	Implement	Requirement
1	MB Plough/reversible plough/Cultivator	25 h of operation
2.	Seed drill/Seed cum fertilizer drill/planter	2 Season testing or else test for specified crops
3.	Plant Protection Equipment	Minimum 48 h of operation
4.	Rotavator	Testing in both puddling and dry tillage
5.	Thresher	25 h of operation and 2 season testing

Strengthening Machinery Testing Facility

- Department of Agriculture & Cooperation and Farmer's Welfare, Ministry of Agriculture and Farmer's Welfare, Government of India vide their Notification No 8-1/2004-My (I&P) dated September 14, 2010 approved 25 Centers located in various states for testing and certifying agricultural machineries and equipments.

- At present 31 centre(s).

Sates	No of facility	Sates	No of facility
J& K	1	Chhattisgarh	1
Punjab	2	West Bengal	2
Haryana	1	Odisha	2
Uttaranchal	1	Bihar	1
Delhi	1	Jharkhand	2
Rajasthan	2	Andhra Pradesh	1
Uttar Pradesh	2	Tamil Nadu	2
Gujarat	1	Karnataka	3
Madhya Pradesh	1	Kerala	1
Maharashtra	3	Sikkim	1

Testing of Farm Equipment

- **Two categories of test**
  - **(1) Commercial**
  - **(2) Confidential**
- **Commercial Tests -** Performance characteristics of machines that are ready for commercial production.
  - Initial commercial tests on indigenous or imported prototype machines ready for commercial production.
  - Batch test on machines which have already undergone initial commercial test and/or are being manufactured commercially in the country.

- **Confidential Tests:** To provide confidential information on the performance of machines, whether ready for commercial production or not or to provide any special data that may be required by the manufacturer/applicant.

- **Test in accordance with Organization for Economic Co-operation and Development (OECD) Standard Test Code: shall be undertaken on machines (which have already undergone initial commercial test) on the specific request of the manufacturer/applicant, exclusively for export purposes.**

- **At Present only CFMTTI, Budni is registered with OECD**

Regulations about Testing

- The testing is governed by an approved Test Regulations. The main features of this regulation are as under:
  - All the tests have to be conducted as per BIS test code as far as possible.
  - The amount of test fee and other estimated expenditure will be intimated to the applicant and they will deposit in advance.
  - Complete Regulations of the testing is available on Institute Website (www.ciae.nic.in/public information/others)

Step by Step Procedure for Commercial Test

- Letter for intent by manufacturer/applicant producing or distributing the equipment/ implement.
- Communication from testing authority present position with respect to test requested (waiting list, possible season of test, testing fee, application form)
- Submission of filled application form, testing fee and technical details of equipment
- Manufacturer to submit equipment (with standard accessories and any additional accessories) along with technical specification in supplied proforma, drawing and photograph.
- Checking of specification.
- Testing of hardness of the parts as per BIS standard.

Cont'd

Step by Step Procedure for Commercial Test

- Field testing of equipment (manufacturer or his representative can witness the test).
- Long Term Testing of equipment
- Preparation of draft report by testing authority and sent to applicant through post.
- Submission of comments by the applicant.
- Release of final report.
- Final report:
  - ✓ 2 copies to applicant
  - ✓ 1 copy with ITMC
  - ✓ 1 copy with head, AMD
  - ✓ 2 copies (spare in file)

Confidential Test

- Manufacturer will submit the test sample along with specification, testing fee and other information as asked by testing authority.
- Equipment will be tested in laboratory/field.
- Test Report will be prepared and sent to manufacturer.
- No applicant comment.
- Test report is confidential.

Cont'd

Confidential Test

- Confidential tests are conducted based upon specific request of manufacturer.
  - ✓ Equipment may be a new/modified design
  - ✓ Not in commercial manufacturing/manufacturer wish to modify existing commercial machinery
  - ✓ Manufacturer wish to get performance data
  - ✓ Advise on modification or improvement in performance (if required).
- After receipt of the request proposal will be submitted to ITMC for fixing the testing fee as per ICAR contract service guidelines.
- After approval communicated to manufacturer.

Laboratory Testing Facility Developed at ICAR-CIAE

Prime Movers: 55 hpTractor

Instrumentation

- Electric Motor (7.5) HP
- Electric Motor (10 HP) with variable Drive

Measuring Instruments

- Dynamometer (100 KW) for testing of Engine of Self-Propelled Machines
- Digital Tachometer (Contact and not contact Type: 0 to 10000 RPM)
- Bore Gauge (Different Range)

Equipment for Material Testing

- Computerized hardness testing machine (Brinell & Rockwell)
- Digital Electronic balance
- Platform type balance
- Hot air oven
- Digital Grain moisture meter

Soil Dynamics Laboratory

Plant protection laboratory

Testing laboratory

Field Testing Facility Developed at ICAR-CIAE

Equipment for draft measurement

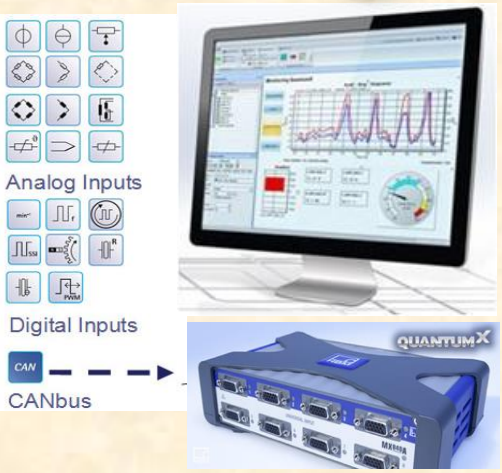
- Universal Data acquisition system (16 channel)
- Load pin for draft measurement (15-20 kN)
- Radar sensor for actual forward speed measurement
- Fuel flow meter (with digital display)
- Proximity sensor for tractor engine RPM and theoretical velocity measurement
- Volume fuel consumption measurement by measuring Jar Set
- Draw wire encoder for depth of operation

Soil Testing Equipment

- Bulk density apparatus
- Digital hand held Moisture meter
- Hydraulically operated instrumented cone penetrometer
- ISI mark soil test sieves with motor
- Noise Measurement System (0-150 db(A))

Workshop and Service tools

- Platform type jack
- Flat bed trolley
- Air compressor
- Tool Kits (spanner, special repair tools, grease guns, torque wrench etc.)



Tests and Evaluations Performed on a Power Tiller

Agricultural power tillers and their attachments (excluding the engine components of tractors and power tillers common to automobiles) are tested in India in Liaison with:

i) ISO/TC 23/SC 2 Common tests
ii) ISO/TC 23/SC 3 Safety and comfort of the operator
iii) ISO/TC 23/SC 4 Tractor
iv) ISO/TC 23/SC 14 Operator control, operator symbols and other displays, operator manuals

Parameter under testing

- Specification checking
- Engine performance test
- Rotary shaft performance test
- Drawbar performance test
- Parking brake test
- Noise measurement
- Air cleaner oil pull over test
- Mechanical vibration measurement
- Turning ability test
- Chemical composition test and wear characteristics test of rotavator blades

Field tests: 75 h - for Initial commercial tests
50 h - for batch test with mould board plough, dry rotavation and puddling.

Tests and Evaluations Performed on a powered knapsack sprayers cum dusters

IS 7593(PT-1):1986 - Power operated pneumatic sprayer-cum-duster Part 1 Knapsack type (first revision) FEB 96
IS 8548:1977 - Test code for power operated hydraulic sprayer
IS 11313:1985 - Hydraulic power sprayer

Parameter under testing

- MATERIAL OF CONSTRUCTION OF VARIOUS COMPONENTS
- PERFORMANCE REQUIREMENTS
  - Air Output
  - Liquid discharge rate
  - Variation in discharge
  - Dust discharge rate
- OTHER REQUIREMENTS
  - Tank
  - Impeller
  - Air bent outlet
  - Air Pressure regulating device
  - Air pressure pipe
  - Flow regulator
  - Air hose
  - straps

Tests and Evaluations Performed on a rice transplanter

- No BIS standard Available
- Done as per ANTAM test code

Testing Activity at ICAR-CIAE

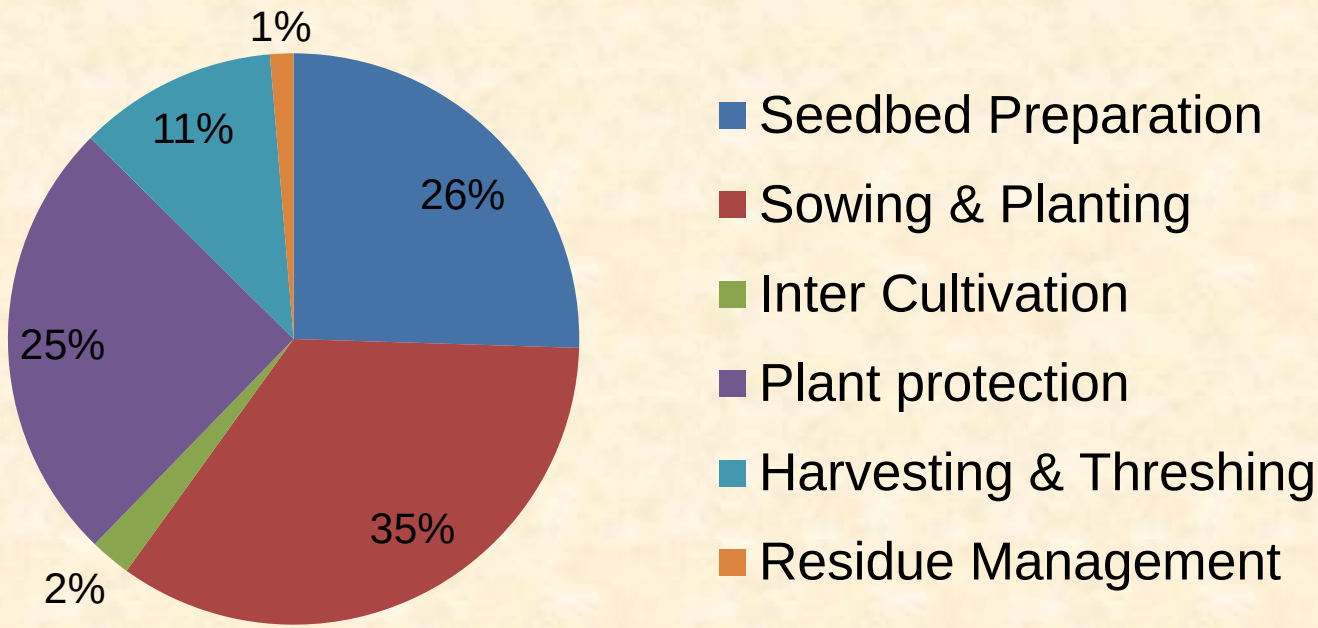
1. Commercial
2. Confidential

From 2010 to December 2017

- Equipment Tested : 316
- Test Reports Issued : 316

Confidential test: 3 Nos.

Distribution of types of equipment tested



List of Agricultural Machinery and Equipment

Sl No	Name of equipment/machine
A	Land development, tillage and seedbed preparation equipment
1	Hydraulic/Mechanical reversible M B Plough
2	Combined tillage tool (tractor drawn)/ integrated tool bar
3	Rotavator
4	Cultivator
5	Disc/ M B Plough
6	All types of harrows

B	Sowing and planting equipment
7	All types of seed drills/seed cum fertilizer drills and pneumatic planters
8	Tractor drawn potato planter
9	Tractor drawn ridger seeder
10	Tractor drawn groundnut planter
11	Tractor drawn sugarcane cutter planter
C	Inter-culture equipment
12	*Power weeder fitted with engine up to 3.5kW*
13	*Any self propelled machine having engine power up to 3.5 kW*
D	Plant Protection equipment
14	Hand operated /power operated knapsack sprayers*
15	Power operated aeroblast/orchard sprayer

E	Harvesting and threshing equipment**
16	Tractor/power tiller / self propelled vertical conveyor reapers*
17	Tractor mounted potato digger elevator
18	Tractor mounted groundnut digger shaker
19	Power sunflower thresher
20	Multi-crop thresher
21	Axial flow paddy thresher
22	Powered groundnut thresher/decorticator
23	Powered maize dehusker/sheller
24	Any other harvesting and threshing equipment
F	Equipment for Residue Management
25	Straw reaper and stubble shaver

***Note:**

1. Self propelled reapers/weeders and other machines up to 3.5 kW engine.

2. PAU Ludhina and CIAE Bhopal centers to test Tractor mounted combine.

Çlo lkf;d ijh{k.k fjiksVZ   la[;k@

No.:04/2012

COMMERCIAL TEST REPORT   elg@Month: February, 2014

KAMDHENU MUTLICROP THRESHER

Central Institute of Agricultural Engineering
Nabi Bagh, Berasia Road, Bhopal-462038 (MP)
Agricultural Mechanization Division

df"k; kaf=dh dj.k ifj"kn~
dsUnzh; df"k vfHk;kaf=dh laLFkku
uchckx] cSjfl ;k jkM] Hkksiky & 462038 ¼e-iz-½

Telephone: 0755-2521000   Fax:0755-2734016

1.0. SCOPE OF TEST

1.1 Laboratory Test

The scope of test was to check and assess the following:

- Checking of specifications
- Running in

1.2 Field Test

- Quality of Work
- Rate of Work
- Labour Requirement
- Ease of Operation and Adjustments
- Breakdowns and Repairs

2.0. METHOD OF SELECTION

The machine was directly submitted by the applicant for test at this institute. Hence, the method of selection in not known.

3.0. TEST PROCEDURE

The sample equipment was tested as per the test code prescribed by following Indian Standards.

IS:6284-1985 Test code for power thresher for cereals
IS:9020 – 2002 Safety requirement for power thresher

4.0. SPECIFICATION

4.1. General

Manufacturer	M/S Modern Agriculture Implements Industries, Plot No. 1-2, Industrial Area, Runija Road, Barnagar, Ujjain - 456771 Madhya Pradesh
Name of applicant	M/S Modern Agriculture Implements Industries, Plot No. 1-2, Industrial Area, Runija Road, Barnagar, Ujjain - 456771 Madhya Pradesh
Name of machine	Kamdhenu Multi crop thresher
Make	Kamdhenu
Model	Hopper Model
Type	Spike Tooth Type
Size of thresher (mm)	3400X1990 X 2680
Serial Number	234/1/13

4.3.2 Crop Feeding System

Method of feeding	**Manual**
Type of feeding system	Hopper system with star wheel
Constructional details	A trapezoidal hopper with star wheel type feeding mechanism is attached to the feeding window. The hopper is supported by angle iron (25x 25 x 3 mm) and bolted with the help of nut and bolts with top cover of threshing cylinder.
Location of feeding system	The Hopper fitted on the Top Cover of cylinder with Nut Bolt
Size of feeding opening (mm)	750x360
Height of feeding chute above the ground level (mm)	1780

Specification of the Feeding hopper with star wheel (Refer IS: 9020 – 2002)

S. NO.	Notations	As per IS:9020-2002	As measured (mm)	Remarks
1	A	-	760	-
2	B	740	775	Conforms
3	C	150	165	Conforms
4	D	545	575	Conforms
5	E	560	350	**Does not Conforms**
6	F	300	119	**Does not Conforms**
7	G	100	22	**Does not Conforms**
8	H	15	09	**Does not Conforms**
9	α	50±5	32^0	**Does not Conforms**
10	Sheet thickness	1.6 mm (min)	1.8	Conforms
11	**Other Requirement**			
No sharp edges shall be provided on the feeding hopper			Edges are not sharp	Conforms
The covered portion of the hopper shall be rigidly attached and shall not be able to be detached without cutting			Properly fixed	Conforms
The hopper should be so fixed with the thresher that is not possible to remove it easily.			Removable with the help of tools	Conforms

4.3.3 Threshing Unit

4.3.3.1 Threshing Cylinder

Type	Peg tooth type, Open
Size of cylinder (mm)	460 X 650 mm
Construction details	It is fabricated by fixing flanges on the main shaft with a rim made of MS flat. Six MS flats of size 640 x 50 x 12 mm is fixed on the rim. Pegs are mounted on these MS flats.
Material	MS flats and bolts or pegs
Size of bar (mm)	50 x 12 (6 Nos.)
Number of teeth on each rasp bar	9 pegs on three bars and 8 pegs on alternate three bars
Dimensions of pegs (Length x diameter), mm	
Peripheral distance between two bar (mm)	

Threshing cylinder speed

Crop	Threshing cylinder speed			
	Rotational (rpm)		Peripheral (m/s)	
Wheat	700-720	640-660	16.75-17.22	15.31-15.79
Soybean	620-720	620-640	14.84-17.22	14.84-15.31

4.3.3.2 Main Shaft

Material	Mild steel bright bars
Size (mm)	2460 X 64 ϕ
No. & type of bearings on shaft	2 Nos. of ball bearing of No.6312
Method of fixing	Bearing are mounted in pedestal 515

4.3.8.3 Transporting hitch

4.3.6.3.1 For tractor

Constructional detail	C Channel of size 120 x 65 x 65 mm is fixed in a triangular fashion such that a rectangular box is formed after the triangular construction of size 120 x 170 x 125. The other end of the C channel is fixed with main frame. A circular MS rod hook of 40 mm diameter is screwed in the rectangular box formed.
Size of hook (OD/ID)(mm)	94 x 34 x 34
Height of the hitch above ground	800

4.3.7 Material of construction

S.No.	Components	As per IS: 2062-1999	Material	Conformity to IS
1	Main frame	M.S. Channel	Mild steel C channel and angle iron	Conforms
2	Feeding Hopper	M.S. Sheet	MS Sheet	Conforms
3	Threshing cylinder	M.S.	Mild steel	Conforms
4	Concave	M.S. Bar	M S flats and square bars	Conforms
5	Shaft	M.S.	MS Bright bar	Conforms
6	Blower	M.S. Sheet	MS	Conforms
7	Straw walker	-	MS angle iron	Conforms
8	Pulleys	Cost Iron	Cast iron	Conforms
9	Transport wheel	M.S., CI, Pneumatic wheels	Pneumatic wheels	Conforms

4.3.8 Adjustment

Items	Method of Adjustment	Range	
		Wheat	Soybean
Threshing cylinder speed (rpm)	By Changing Pulley/setting the engine speed/Tractor	640-660	620-720
Concave clearance (mm)	By lowering/raising the concave	13	6-13 mm
Blower speed (rpm)	Changes according to threshing cylinder speed	Same as main shaft	620-720
Shaker pulley speed (rpm)	By Changing pulley	250 – 350	250-350
Length of stroke (mm)	Adjustable		
6	Inclination of bottom sieve, deg	15	15
7	Opening of blower shutters	Fully closed	Fully closed

6. PERFORMANCE TEST

Thresher was tested for its performance in wheat and soybean crop. The multi-crop thresher was operated in institute's threshing yard for soybean threshing and at village Kachibarkehda for wheat threshing. For each crop the tests were conducted in three short run trials. The tests were conducted at optimum speed and optimum capacity for each crop. For wheat the tests were conducted with Malwa Shakti 8498 variety and for Soybean the tests were conducted for JS 9752 variety. The wheat crop was harvested about a week before the threshing was carried out, while the soybean crop was harvested about ten days before the threshing was done. The crop was sun dried on the threshing floor of the institute. The machine was placed on a pucca floor and proper leveling was done. The samples were taken and analyzed for various parameters. The crop and machine parameters of the tests are given below;

6.1 Crop Parameters

Sl. No.	Parameter	Range	
1	Name of crop	Wheat	Soybean
2	Variety	Malwa Shakti 8492	JS 9752
3	Grain-Straw ratio	1:1.09-1: 1.15	1:2.22- 1: 2.80
4	Moisture content of grain (db), %	9.03-9.64(9.15)	9.41-11.1 (10.3)
5	Moisture content of straw (db), %	13.68-16.13(14.86)	13.46-13.91(13.69)

6.2 Machine Parameters

Sl. No.	Parameter	Range	
		Wheat	Soybean
1	Threshing cylinder speed, rpm No load On load	 700-720 632-720	 620-640 620-630
2	Blower speed, rpm	632-720	620-630
3	Shaker unit speed, rpm No load Load	 360-400 320-360	 320-330 323-325

Wear Assessment

6.8.1 On mass basis

Randomly 6 pegs were selected and weighed and marked and fitted in the thresher. After testing work has been completed, these pegs were removed and weighed for assessment of the wear on mass basis.

S. NO.	Mass of Pegs, g		Percentage Wear	Hourly wear (%)
	Initial	After 37.6 h of operation		
1	500.2	480.2	4.00	0.11
2	501.2	471.8	5.87	0.16
3	499.5	479.9	3.92	0.10
4	499.1	481.1	3.61	0.10
5	500.5	478.6	4.38	0.12
6	498.6	480.3	3.67	0.10
			Average	0.11

Other parts of test reports

Defects, Break Downs and Repairs

- No specific defects/breakdown was encountered during 37.6 h of the operation of machine

Adequacy of literature

A printed leaflet on directions for operation and safety was provided by the firm in Hindi. Modifications needs to made to develop it as operator's manual pictorial language to be followed. Following needs to be added in the document;

- Illustrative safety norms to be followed during operation of thresher. (with pictorial representations) as provided on thresher body should also be provided in literature.
- List of recommended lubricants.

Applicants Comment, if any

- We will improve the hopper as per IS dimensions.

Pictorial presentation of caution 7.6© and 7.6(j) is attached and will be made available with all threshers

Some Observations (After Testing The Equipment)

- Hardness of the soil engaging parts, Beaters/pegs of thresher, rotavator blades
- Chemical Content of the soil engaging parts
- Standardization of three point linkage (IS 4468-part I)
- Variability of seed/fertilizer delivery rates (IS:6813- 7.5% Seed and 12.5% Fertilizer).
- Inter row variability in delivery rates some times more than 15%.
- No Operator/Service Manual.


THANKS