The Russian Network for Testing of Agricultural Machinery

Vadim Pronin
Chairman of the Association of Test Engineers of Agricultural Machinery and Technologies of the Russian Federation (ATEAM)
Director of the Volga Testing Station

FORMATION AND DEVELOPMENT OF TESTING IN RUSSIA

1948 year. Creating a system of machine-stations of the 16 stations

1907 year. Beginning of work testing stations in Russia

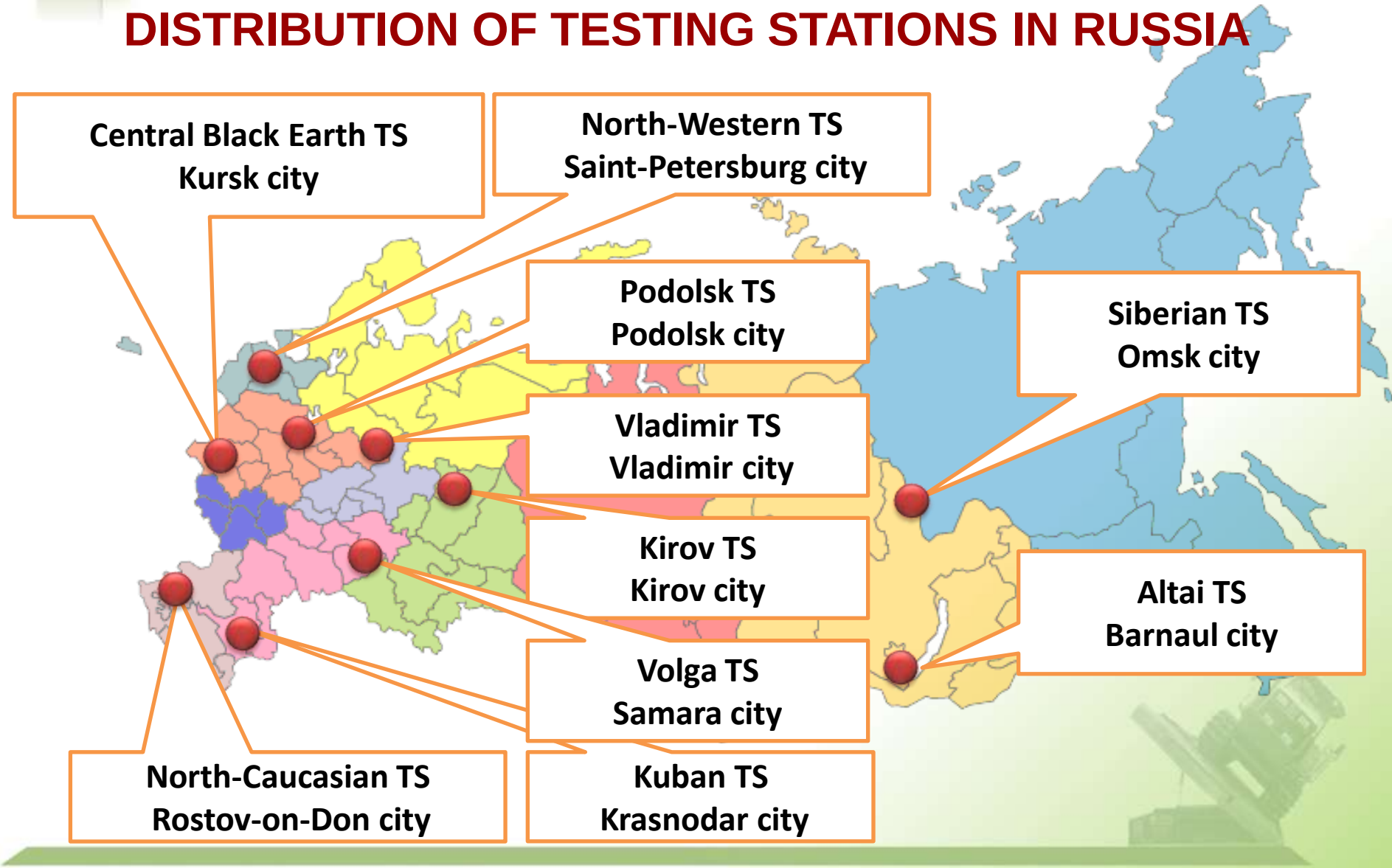
1875 year. First test of grain seeder

2013 year, June 11. 65 years anniversary

- 11 machine-zonal stations
- 970 employee

HISTORICAL REFERENCE

DISTRIBUTION OF TESTING STATIONS IN RUSSIA



VOLGA MACHINERY TESTING STATION

20 km from Samara city

165 employees	**STAFF**	9 workers with advanced degrees 53 dipl. engineers
–14 °C **+20 °C**	**CLIMATE**	250 - 500 mm rainfall 2.26 t / ha grain yield
4562,5 ha	**LAND Resources**	12.5 ha under buildings 4550 ha of arable land
100-120 machines	**annual number of tests**	Machinery for crop, livestock, electrical installations

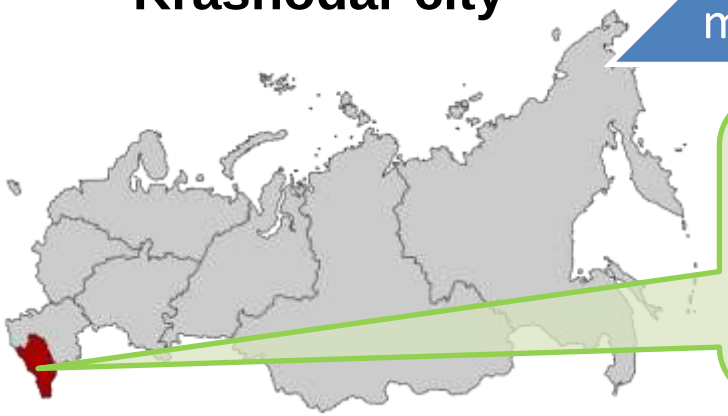
TERRITORY OF ACTIVITY

VOLGA Federal district
14 regions

KUBAN MACHINERY TESTING STATION

180 km from Krasnodar city

117 employees	**STAFF**	3 workers with advanced degrees 37,3% dipl. engineers
–4 °C **+23 °C**	**CLIMATE**	500 – 600 mm rainfall 5,18 t / ha grain yield
29,1 га	**LAND Resources**	29,1 ha under buildings
90-100 machines	**annual number of tests**	Machinery for crop production, horticulture, viticulture



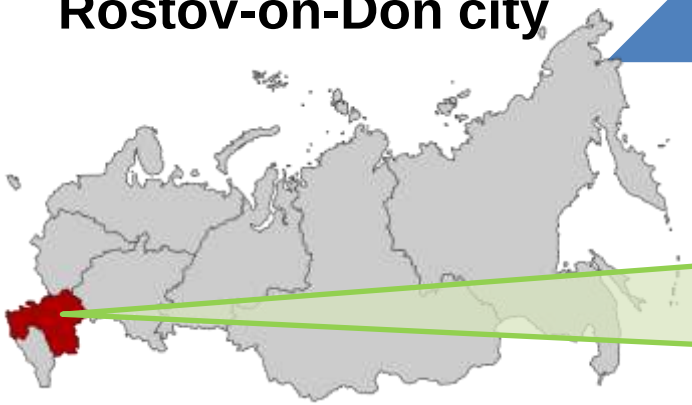
TERRITORY OF ACTIVITY

NORTH-CAUCASIAN
Federal district
7 regions

NORTH-CAUCASIAN MACHINERY TESTING STATION

60 km from Rostov-on-Don city

158 employees	**STAFF**	3 workers with advanced degrees 41,7% dipl. engineers
–7 °C **+23 °C**	**CLIMATE**	400 – 650 mm rainfall 2,68 t /ha grain yield
9,15 га	**LAND Resources**	9,15 ha under buildings
100-120 machines	**annual number of tests**	Machinery for crop production, horticulture, viticulture



TERRITORY OF ACTIVITY

SOUTHERN Federal district
6 regions

CENTRAL BLACK EARTH MACHINERY TESTING STATION

10 km from Kursk city

123 employees	**STAFF**	1 worker with advanced degrees 31,8% dipl. engineers
–8 °C **+19 °C**	**CLIMATE**	470 – 640 mm rainfall 4 t /ha grain yield
291,4 ra	**LAND Resources**	9,4 ha under buildings 282 ha of arable land
80-90 machines	**annual number of tests**	Machinery for plant growing, vegetable growing, animal husbandry

TERRITORY OF ACTIVITY

CENTRAL Federal district
17 regions

NORTH-WESTERN MACHINERY TESTING STATION

60 km from Saint-Petersburg city

90 employees	**STAFF**	2 workers with advanced degrees 28% dipl. engineers
–9 °C **+17 °C**	**CLIMATE**	600 – 700 mm rainfall 3 t /ha grain yield
4331,6 га	**LAND Resources**	5,6 ha under buildings 4326 ha of arable land
90-110 machines	**annual number of tests**	Equipment for plant growing, cattle breeding and processing of grain

TERRITORY OF ACTIVITY

NORTH-WESTERN
Federal district
10 regions

SIBERIAN MACHINERY TESTING STATION

30 km from Omsk city

56 employees	**STAFF**	49% dipl. engineers
–20 °C +18 °C	**CLIMATE**	300 – 500 mm rainfall 1,72 t / ha grain yield
9,25 га	**LAND Resources**	9,25 ha under buildings
50-60 machines	**annual number of tests**	Equipment for plant growing and processing of grain

TERRITORY OF ACTIVITY

URALS and SIBERIAN Federal districts
12 regions

ALTAI MACHINERY TESTING STATION

200 km from Barnaul city

87 employees	**STAFF**	38% dipl. engineers
–22 °C +27 °C	**CLIMATE**	230 – 600 mm rainfall 1,38 t / ha grain yield
4697,2 га	**LAND Resources**	15 ha under buildings 4682 ha of arable land
50-60 machines	**annual number of tests**	Equipment for plant growing and processing of grain

TERRITORY OF ACTIVITY

SIBERIAN and FAR EASTERN Federal district
12 regions

The Association of Test Engineers of Agricultural Machinery and Technologies of the Russian Federation (ATEAM)

VLADIMIR MACHINERY TESTING STATION

80 km from Vladimir city

56 employees	**STAFF**	1 workers with advanced degrees 45% dipl. engineers
–9 °C **+19 °C**	**CLIMATE**	550 – 600 mm rainfall 2 t / ha grain yield
3,53 га	**LAND Resources**	3,53 ha under buildings
90-110 machines	**annual number of tests**	Equipment for plant growing and processing of grain

TERRITORY OF ACTIVITY

CENTRAL Federal district
12 regions

KIROV MACHINERY TESTING STATION

40 km from Kirov city

61 employees	**STAFF**	44,6% dipl. engineers
–14 °C +18 °C	**CLIMATE**	500 – 680 mm rainfall 2 t / ha grain yield
210,88 га	**LAND Resources**	6,28 ha under buildings 204,6 ha of arable land
50-60 machines	**annual number of tests**	Equipment for plant growing and processing of grain

TERRITORY OF ACTIVITY

Regions of the NORTH-WEST and VOLGA Federal districts
7 regions

PODOLSK MACHINERY TESTING STATION

5 km from Podolsk city

86 employees	**STAFF**	51,2% dipl. engineers
–10 °C +19 °C	**CLIMATE**	500 – 700 mm rainfall 2,78 t /ha grain yield
957,8 ra	**LAND Resources**	5 ha under buildings 952,8 ha of arable land
70-80 machines	**annual number of tests**	Equipment for livestock production, electrical installation

TERRITORY OF ACTIVITY

CENTRAL Federal district
12 regions

Scientific Research Institute ROSINFORMAGROTECH

30 km from Moscow city

130 employees	**STAFF**	23 workers with advanced degrees 61,2% dipl. engineers
–10 °C +19 °C	**CLIMATE**	500 – 700 mm rainfall 2,78 t /ha grain yield
2212,1 га	**LAND Resources**	19,7 ha under buildings 2190,4 ha of arable land
10-20 machines	**annual number of tests**	Product innovations of agricultural machinery

ACTIVITIES

METHODOLOGIES OF TESTS;
INFORMATION AND PUBLISHING;

LEGISLATIVE AND REGULATORY FRAMEWORK

FEDERAL LAW
«ON TECHNICAL REGULATION»

International and national standards
(GOST R, GOST R ISO and others)

Standards ATEAM- **160** PCs

Росстандарт

TYPES OF ASSESSMENTS

1. Technical expert examination
2. Evaluation of design safety
3. Agrotechnical (zootechnical) evaluation
4. Energy parameters assessment
5. Operational and technological evaluation
6. Evaluation of design reliability
7. Evaluation power and fuel-economic properties of tractors
8. Evaluation of traction properties of tractors
9. Analysis of quality fuel and lubricants
10. Evaluation of economic indicators

TECHNICAL EXPERT EXAMINATION

1

- Technical characteristic
- Quality of manufacturing
- Accompanying documents

Dimensional measurement

Assessment
of the coating quality

Load
distribution measurement

EVALUATION OF DESIGN SAFETY

2

- Static and dynamic stability
- Cabin and operator workplace ergonomics
- Observability and dirigibility
- Mounting of attached equipment
- Safety during transportation
- Design evaluation in operation environment

Evaluation of lighting devices

Operator workplace ergonomics

Evaluation of the sustainability

AGROTECHNICAL ASSESSMENT

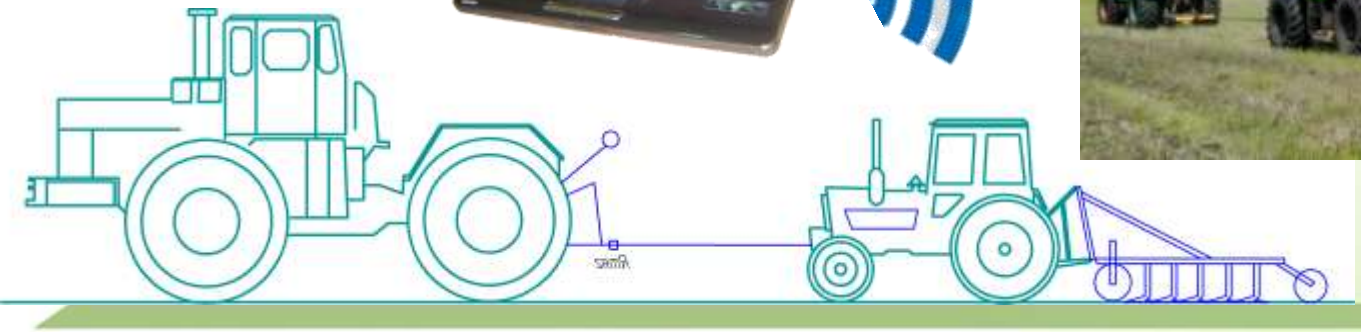
3

Harvesters	Seeders	Tillage machine	Sprayers
			
-losses of grain; -crushing; -contamination; -throughput; -grinding straw	-irregularity of seeding; -instability of seeding; -norm; -crushing; -depth of seeding	-crushing of soil; -depth; -qulality of stubble; - smoothness of arable land	-norm of consumption and irregularity; -drops size; -density of coverage drops; -concentration of the working fluid; -damage to plants

ENERGY PARAMETERS ASSESSMENT

4

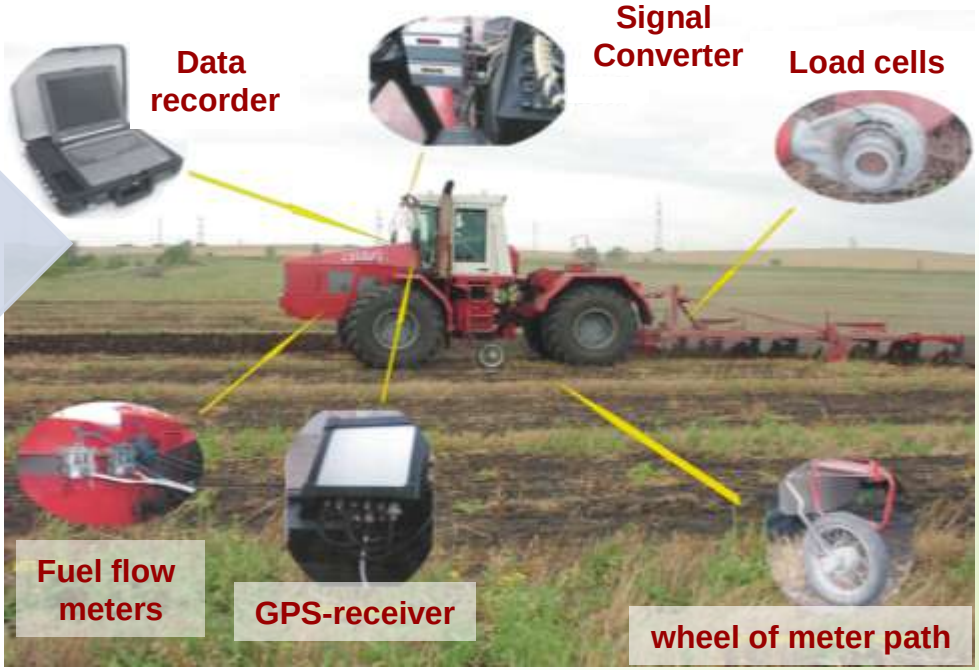
- tractive resistance;
- consumed power;
- specific power consumption



OPERATIONAL AND TECHNOLOGICAL EVALUATION

5

- production rate;
- fuel consumption;
- consumption of time on operations



Instant fuel consumption.

Fuel consumption per hectare

EVALUATION OF DESIGN RELIABILITY

6

- mean time to failure;
- repair time;
- wear of the working elements;

Reliability is estimated in operating hours not less than:
- 100 hours for agricultural machinery;
- 1000 h for tractors.

Assessment of the wear of the working elements

ENGINE TESTS

7

- collecting regulatory characteristics;
- power engine;
- torque;
- specific fuel consumption

Test engine power up to 400 kW

DRAWBAR POWER AND FUEL CONSUMPTION

8

- maximum Drawbar Pull;
- power at the Drawbar;
- slipping;
- traction efficiency;
- range of operating speeds

Drawbar Pull up to 200 kN

TEST STANDS FOR HYDRO MOUNTED SYSTEMS OF TRACTORS

Force load…… < 100 кН;

Time of retention of stable load;

The maximum height of the force.

FUEL AND LUBRICANTS QUALITY ANALYSIS

9

- Content of acids and alkalis
- Fractional composition
- Octane or cetane number
- Kinematic viscosity
- Flash point
- Coefficient of filterability
- Water content
- Density at 20 °C
- Content of mechanical impurities

ECONOMIC INDICATORS EVALUATION

10

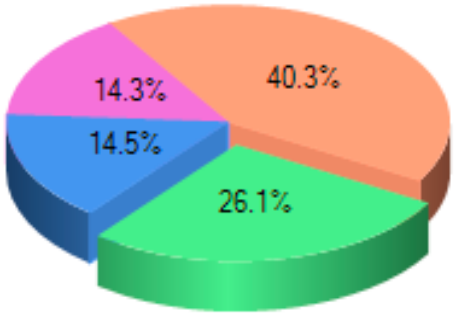
- amortization;
- wage;
- repair costs;
- fuel costs;
- cost of works

Kirovetz-744R3 (287 kW)

18640
RUR/kW

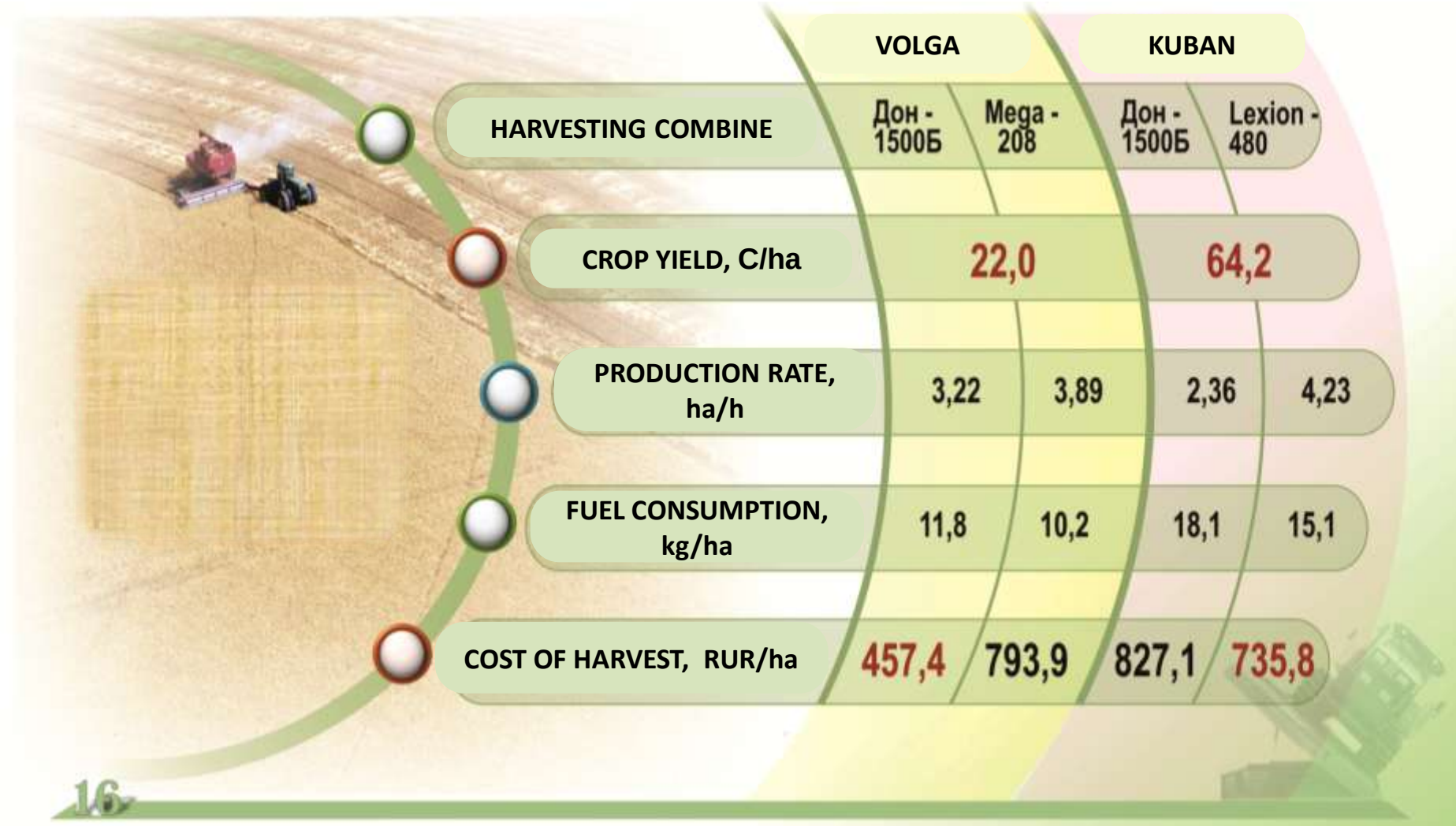
1618
RUR/h

Structure of cost of technology



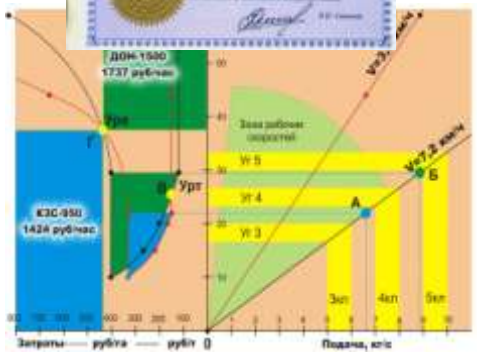
N	Наименование	Сумма, руб/га	Вес, %
☑	Прямые технические затраты	3553.72	26.1
☐	Семена	1980	14.5
☐	Минеральные удобрения	1944	14.3
☐	Хим. средства защиты растений	5482.9	40.3

GRAIN HARVESTERS EFFICIENCY ASSESSMENT



	VOLGA		KUBAN	
HARVESTING COMBINE	Дон - 1500Б	Mega - 208	Дон - 1500Б	Lexion - 480
CROP YIELD, C/ha	22,0		64,2	
PRODUCTION RATE, ha/h	3,22	3,89	2,36	4,23
FUEL CONSUMPTION, kg/ha	11,8	10,2	18,1	15,1
COST OF HARVEST, RUR/ha	457,4	793,9	827,1	735,8

SCIENTIFIC RESEARCH WORK



- ✓ Research of machine-tractor Park of Samara region;
- ✓ Research of efficiency of machine technologies in plant growing;
- ✓ Investigation of the technology of cultivation of soybeans in the Samara region;
- ✓ Development and implementation of an online agricultural Advisory system;
- ✓ Development of perspective design of the soil-cultivating machines;
- ✓ Development of import-replacing equipment of dairy farms;

PRESENTATION OF THE TEST RESULTS


МИНИСТЕРСТВО СЕЛЬСКОГО ХОЗЯЙСТВА РОССИЙСКОЙ ФЕДЕРАЦИИ

ДЕПАРТАМЕНТ НАУЧНО-ТЕХНОЛОГИЧЕСКОЙ ПОЛИТИКИ И ОБРАЗОВАНИЯ

ФГБУ «ПОВОЛЖСКАЯ ГОСУДАРСТВЕННАЯ ЗОНАЛЬНАЯ МАШИНОИСПЫТАТЕЛЬНАЯ СТАНЦИЯ»

ПРОТОКОЛ № 08-36-2013

от 18 октября 2013 года

СРАВНИТЕЛЬНЫХ ИСПЫТАНИЙ ПНЕВМАТИЧЕСКИХ СЕЯЛОК ПРЯМОГО ПОСЕВА DMC-4500

(по договору № 15/1ср-13 от 27.03 2013 г.)

г. Кинель, 2013 г.

TEST REPORT


Трактор ЧН-6

Технико-экономические показатели

SUMMARY REPORT for publication


МИНИСТЕРСТВО СЕЛЬСКОГО ХОЗЯЙСТВА РОССИЙСКОЙ ФЕДЕРАЦИИ

ФГБУ «ПОВОЛЖСКАЯ ГОСУДАРСТВЕННАЯ ЗОНАЛЬНАЯ МАШИНОИСПЫТАТЕЛЬНАЯ СТАНЦИЯ»

ОТЧЕТ

по научно-исследовательской теме

«Сравнительные исследования и испытания конструкций отечественных и зарубежных зерноуборочных комбайнов с оценкой эксплуатационно-технических и экономических показателей эффективности их применения в хозяйствах Самарской области»

(контракт № 22 от 24 октября 2013 года)

г. Кинель, 2013 год

RESARCH REPORT

PUBLICATION OF TEST RESULTS

Websites of MTS:
more 1500 visitors a day

Periodicals:

«Annual bulletin each of MTS»;

«Annual bulletin of agricultural machinery testing» (1000 copies);

«Monthly Agro-Inform» (3000 copies) rubric «Tested on the Volga MTS»

«Monthly Information Bulletin of the Ministry of agriculture in Russia» (5000 copies) rubric «Verifiers recommend»

REGULAR PUBLICATION ON THE WEBSITES

http://

- www.mcx.ru
- www.aist-agro.ru
- www.povmis.ru
- www.altmis.ru
- www.kirovmis.ru
- www.sibmis.ru
- www.kubmis.ru
- www.szmis.ru
- www.podolskmis.ru
- www.chmis.ru
- www.vladmis.ru

More

1500

visitors a day

EXHIBITION ACTIVITY

Volga TS is a base for Annual Federal Volga Agricultural exhibition. Participated more than 400 companies and more than 30 000 visitors last year.

COMPARISON TESTS

In 2012 comparative tests of 102 agricultural machines in different zones of Russia: Samara, Krasnodar, Rostov-on-don, Kursk, St. Petersburg, Omsk

- **20** • Grain harvesters
- **6** • Forage harvesters
- **20** • Wheeled tractors
- **28** • Tillage machines
- **18** • Sowing complexes and seeders
- **5** • Machines for fertilizer application
- **5** • Machines for plants protection

Test participants :

CLAAS	**New Holland**
John Deere	**Deutz Fahr**
Versatile	**MTZ**
Amazone	**Quivogne**
Flexi-Coil	**Horsch**
Hardi	**Unigreen**
Jar-Met	**Rauch**

...and 30 Russian enterprises

Thank for attention!

For more information please contact us:

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