



MINISTRY OF AGRICULTURE
RUSSIAN FEDERATION
RSAU-MAA NAMED AFTER
K. A. TIMIRYAZEV

The teaching of students in the course of management within agricultural enterprise during real time with the appliance of GNSS

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professor Balabanov Victor Ivanovich
professor Zeileger Anatoliy Mikhailovich

RSAU-MAA NAMED AFTER K. A. TIMIRYAZEV

- ✘ The three institutions
 - 14 faculties
 - 100 chairs
 - Branches
 - Postgraduate and Doctorate
 - Experimental bases in different climatic zones of Russia
 - 18 thousand students

The directions of study in the RSAU-MAA

Bachelor`s degree according to the directions of study

09.03.03 – The applied informatics in economics

38.03.05 –Business-informatics

35.03.01 –Forestry-business (the profile of forestry and forestry-parking husbandry)

23.04.03 –The exploitation of transport-technological machinery and complexes

Masters` degrees according to the directions of study

09.04.02 –Information or data-oriented systems and technologies

09.04.03 –The applied informatics (Information or data-oriented systems in logistics and the program «Geo-data-oriented, aero-space and navigation technologies for the monitoring of the regional nature-economical systems)

35.04.01 –Forestry-business

23.04.03 –The exploitation of transport-technological machinery and complexes

FEDERAL TARGETED PROGRAMS OF THE MINISTRY OF AGRICULTURE OF THE RUSSIAN FEDERATION :

- ✘ Agricultural Land Degradation Development for 2014 – 2020
- ✘ Agricultural development and regulation of markets of agricultural products, raw materials and food for 2013-2020

Monograph

Управление сельхозпредприятием
с использованием космических
средств навигации
(ГЛОНАСС) и дистанционного
зондирования Земли



Москва 2016

The management of the agricultural enterprise with the appliance of space navigation means (GLONASS) and distance zoned probes of the Earth : Monograph /

- ✘ E. F. Shulga, A.O. Kupriyanov, V.K. Khlustov, V.I. Balabanov, A.M. Zeileger. M.: Publish. house RSAU-MAA named after K.A. Timiryazeva, 2016. 282 p. bibliograph. nam. 94.

MONOGRAHY CONTENT

- ✘ Actual state and prospects of GNSS development
- ✘ Technologies of land, water and plant resource mapping
- ✘ Precise agriculture
- ✘ Real-time operational “Manager-agriculture vehicle” & “Driver-vehicle” management
- ✘ Irrigated agriculture management in the base of GNSS & RS data

The rewards from RSAU-MAA

<http://www.timacad.ru/news/detail.php?ID=21115>



<http://www.timacad.ru/news/detail.php?ID=23906>



MAPPING TECHNOLOGIES OF LAND, WATER AND PLANT RESOURCES

График агроэкологического мониторинга

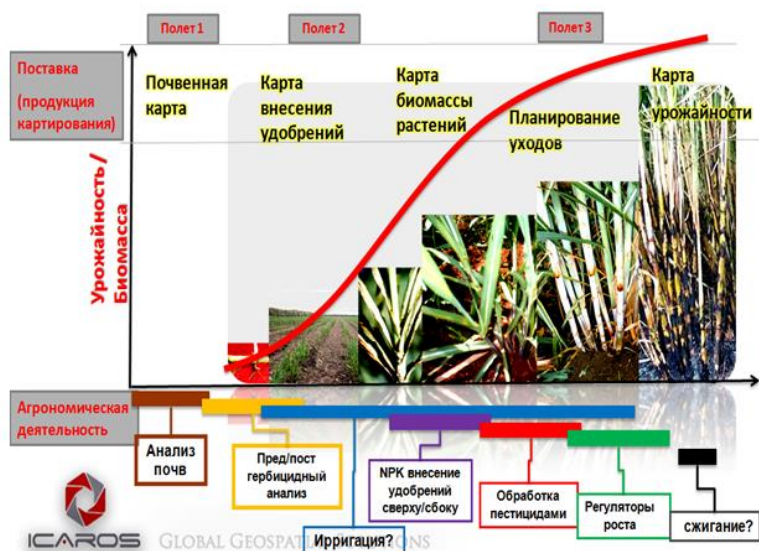


Рис. 2.20. Схема проведения агроэкологического менеджмента

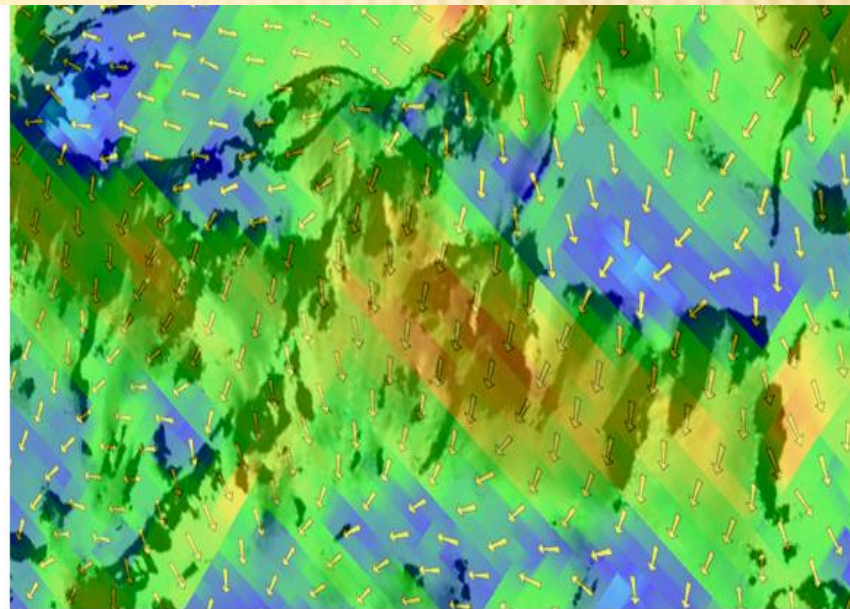


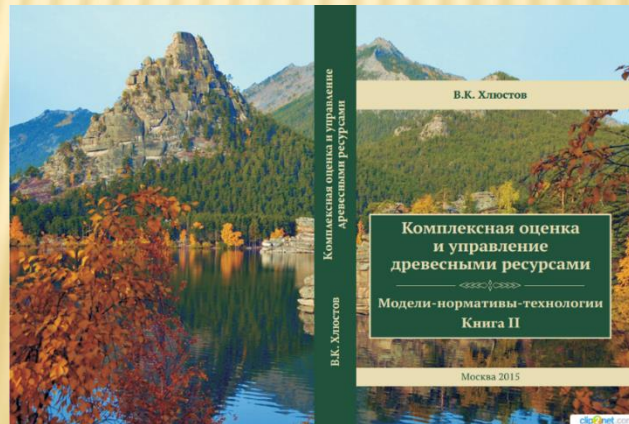
Рис. 2.24. Направления смыва пылеватых частиц водными потоками

Actual and full information (data)

THE DIGITAL ELEVATION MODEL

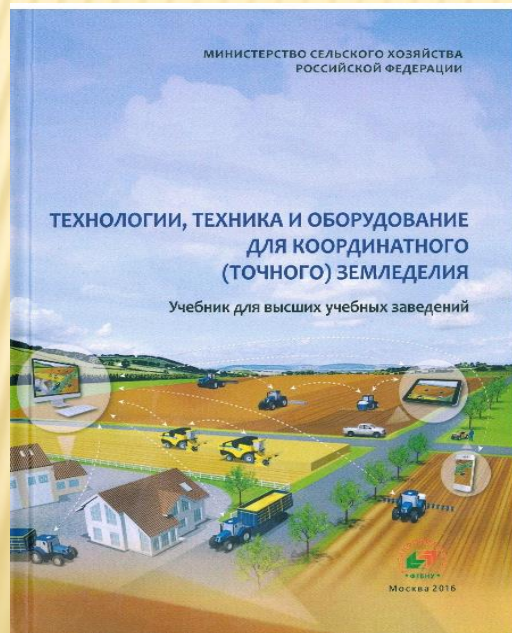


Unmanned airspace vehicle «Geoscan-201»

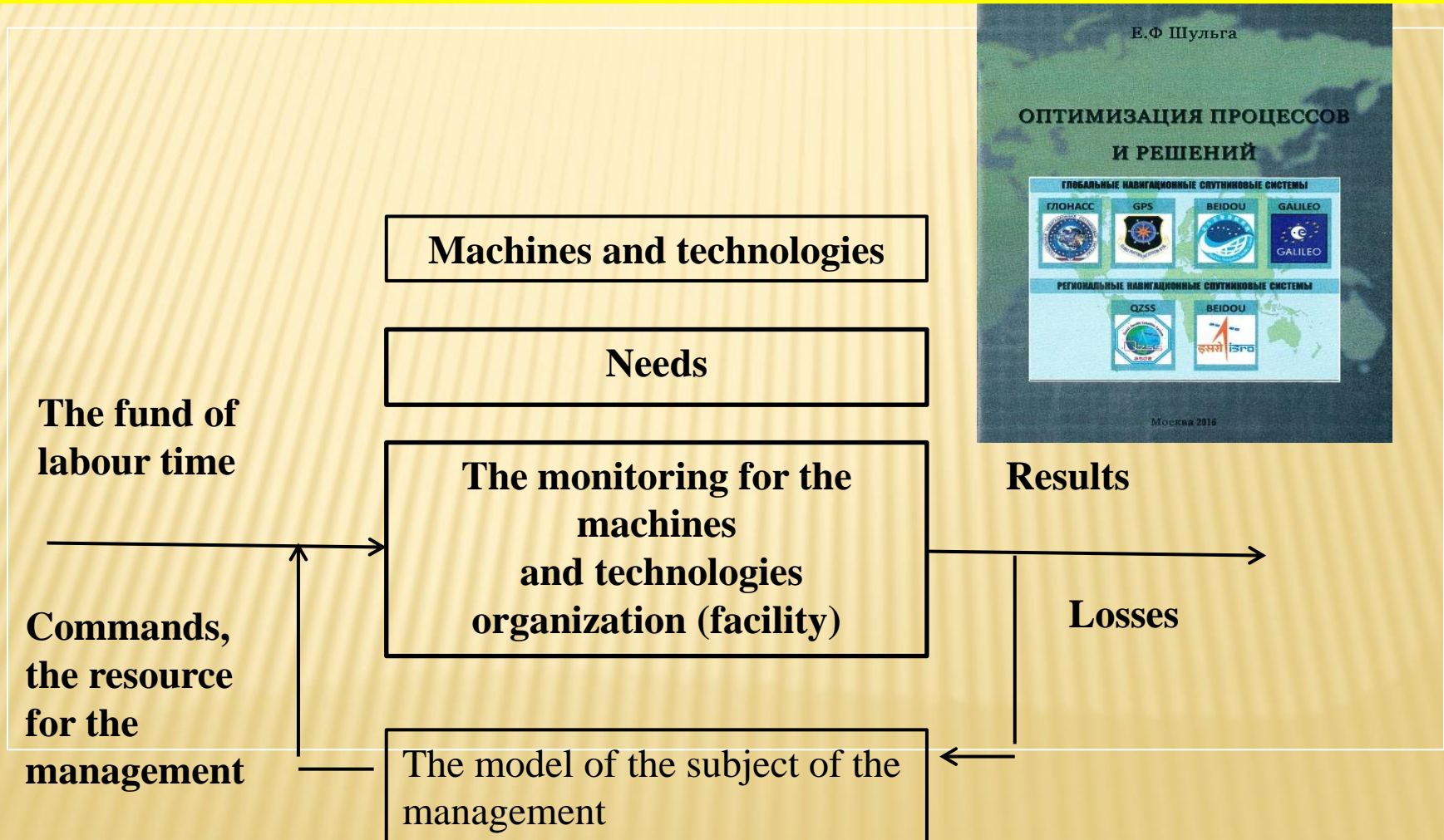


Coordinate (precision) agriculture

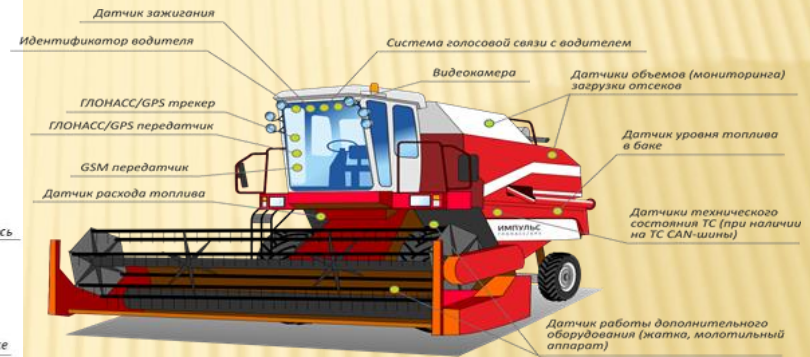
- ✘ Parallel and automatic driving
- ✘ Differentiated fertilizers` application
- ✘ Variable rate sprinkling irrigation



The optimization approach for the processes and decisions making with the appliance of navigation data (placements, the directions of movement and velocities or speed)



The Objects under control



The model for the operative planning within agricultural work activities

The optimized totality of the schedules

The resource for the management and control

Machines and technologies

Planned quality

Admissible losses

The optimized totality of the schedules

The management and control resource

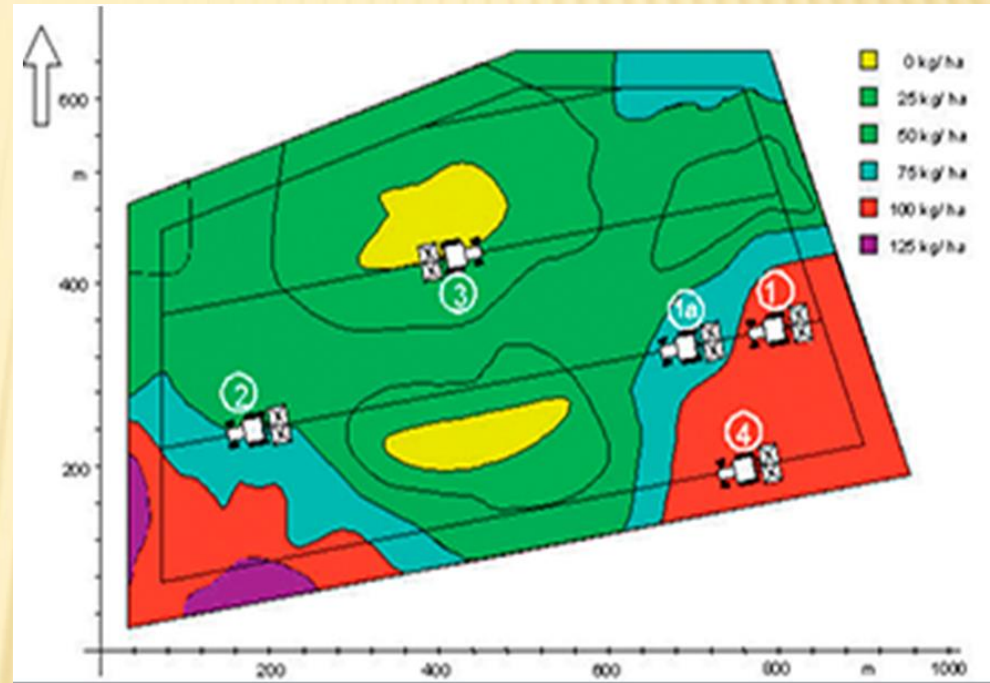
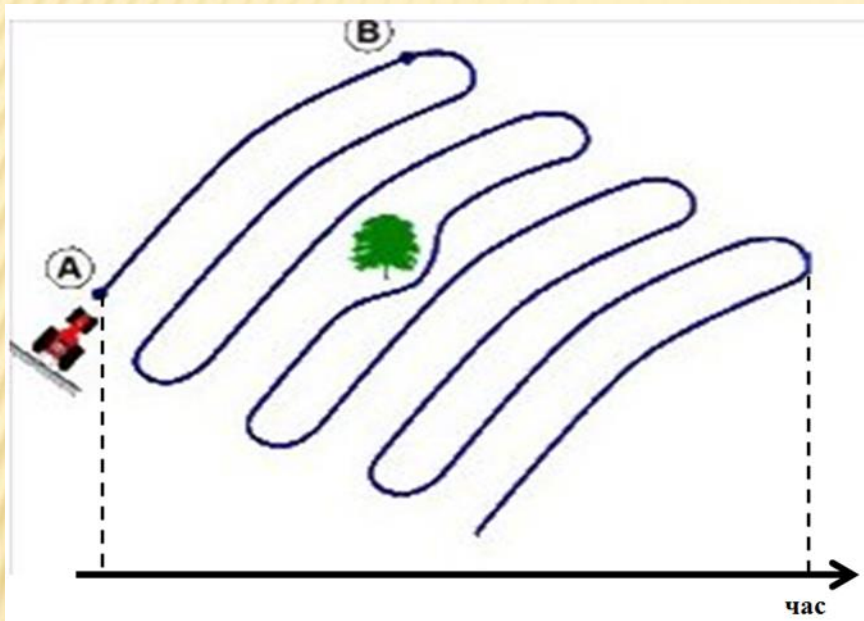
Machines and technologies

Factual quality

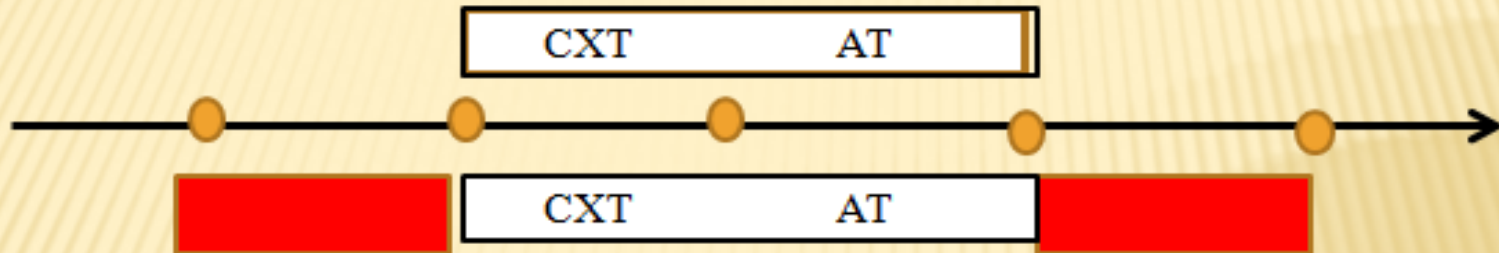
Factual losses due to the quality decreasing



The imitating procedure for the planned map-task «Driver-Agricultural machinery»



The imitating procedure for the systems: The system «driver-agricultural machinery» and «driver-truck»



	Plan type	The plan evaluation, \$
1	TC1-CXT2; TC2-CXT1; TC3 -CXT3	$0,17+0,2+0,19 = 0,56$
2	TC1-CXT1; TC2-CXT2; TC3-CXT2	$0,1+0,1+0,19 = \mathbf{0,39}$
3	TC1 -CXT1; TC2-C-CXT3; TC3-CXT2	$0,1+0,23+0,25 = 0,58$
4	TC1-CXT3; TC2-CXT1; TC3-CXT2	$0,21+0,1+0,22=0,53$
5	TC1-CXT3; TC2-CXT1; TC3-CXT2	$0,21+0,2+0,25=0,66$

The cause-and-case link «Quality-losses»

Е. Ф. Шульга



Работа в диспетчерской программе с навигационным обеспечением

Схема информационного взаимодействия участников образовательного процесса



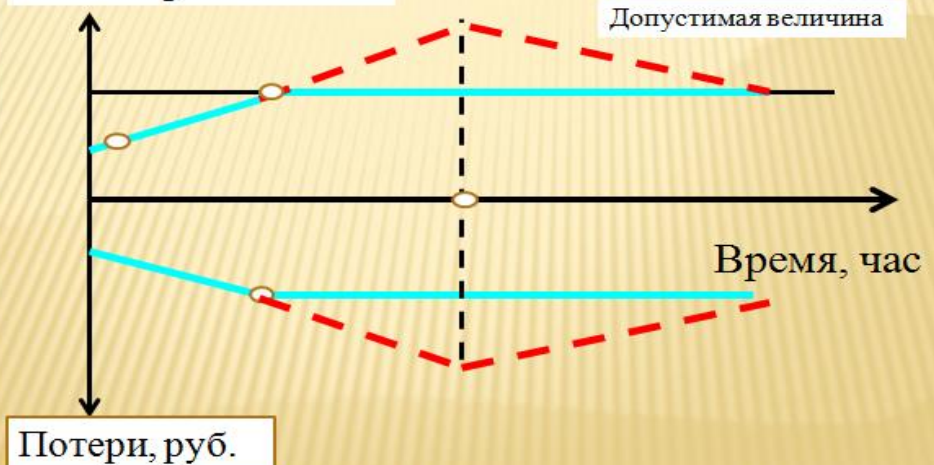
Москва
ООО «УМЦ «Грилья»
2016

Несвоевременность



УПРЕЖДЕНИЕ ОТКЛОНЕНИЙ

Несвоевременность



VARIABLE RATE SPRINKLING SPATIAL-IRRIGATION

Мониторинг параметров

Пространственный анализ

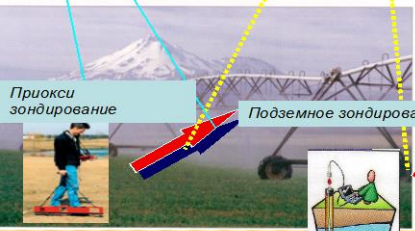
Реализация и контроль

Дистанционное зондирование

Слои данных



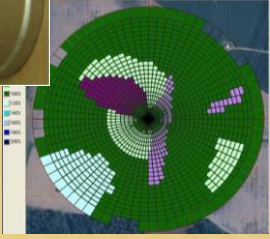
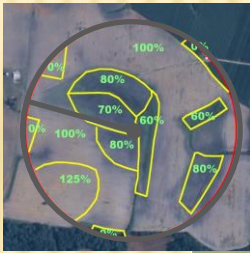
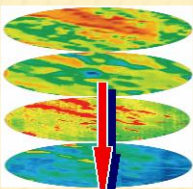
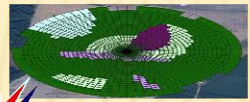
Орошаемое поле



Приоси зондирование

Подземное зондирование

Карта поля



THE COMPONENTS OF THE INTEGRAL EFFECT

	Technology	The effect of cost reduction,%
1	Technology mapping of land, water and plant resources	14
2	Parallel driving and avtodriving	9
3	Variable rate sprinkling irrigation	16
4	Simulation of movement in the planning stage	5
5	warning of deviations	10
6	warning of deviations	16

Thank you for your attention

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