# Soil Fertility of the Agricultural Land in Latvia and Measures for Sustainable Land Management

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*,,The most important reserves of implementing the food program in Uzbekistan", Tashkent on 5-6 June, 2014*

# The Authorities Competent of Latvian Soil

- **State Land Service**
- **State Plant Protection Service (SPPS)**

- **Scientific institutions:**
- ***University of Latvia***
- ***Latvia University of Agriculture***
- ***Latvian State Forestry Research Institute ,,Silava "***

# Competence of Agrochemical Department of the SPPS

- **Soil agrochemical research** *(further - SAR)*
- **Analyses of the soil and fertilisers**
- **Supervision of the circulation of fertilisers**
- **Control of the fertilisation** *(all Territory of Latvia)* **and fertilisation plans** *(in Nitrate valuable area)*

# Agrochemical Characteristics of the Agricultural Land in Latvia

*,,The most important reserves of implementing the food program in Uzbekistan",*
*Tashkent on 5-6 June, 2014*

# National Legislation

- **Law On Agriculture and Rural Development** *(23.04.2004)*

- **Cabinet Regulations No. 833 of 05.10.2004 ,, Procedure for obtaining and compiling information on agricultural land fertility levels and trends “**

- **Ministry of Agriculture, on March 15, 2007 order No. 12 ,,Guidance for soil agrochemical research and studies to evaluate the results "**

# What Does the Concept *,,Soil Agrochemical Research"* (further – SAR) Mean

- A professional soil sampling with specific probes, according to the Latvian State Land Service soils maps indicated soil type and particle size distribution.
- Soil agrochemical measurement in accredited laboratory of soil analysis carried out methods approved by the Ministry of Agriculture.
- The data are entered and stord at **SAR** database.
- The analytical results are evaluated in accordance with Latvian scientists developed and groups of agrochemical indicies have been approved by the Ministry of Agriculture
- **SAR** materials include chemical studies of soil maps, the preparation and issuance to the customer.

# Soil Sampling

# Soil Samples

# Soil Samples

# Soil Chemical Studies Map

# Soil Agrochemical Parameters and their Evaluation

| Zemes kadastra numurs | Aug-snes par. nr. | Pla-tī-ba, ha | Zemes lietošanas veids | Augs-nes apz. * | Gra-nul sast. ** | Organisko vielu saturs | | | Augsnes reakcija $pH_{KCl}$ | | Jādod $CaCO_3$ (t/ha) | Kustīgā fosfora saturs (mg/kg) | | | Kustīgā kālija saturs (mg/kg) | | | Apmaiņas magnija saturs (mg/kg) **** | | Augsnes agroķīmiskās iekultivēšanas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | fakt. (%) | gru-pa | vēla-mais (%) | fakt. | novērtējums | | fakt. | nodrošinā-jums | vēla-mais | fakt. | nodrošinā-jums | vēla-mais | fakt. | nodrošinā-jums | ind. | pakāpe |
| 94920070006 | 1 | 3.40 | Tīrumi | Pgv | mS | 2.3 | 2 | 2.0-2.5 | 6.1 | Normāla | - | 190 | Ļoti augsts | 120-180 | 174 | Augsts | 160-200 | nav analizēts | | 0.99 | Laba |
| 94920070006 | 2 | 2.90 | Tīrumi | Pgv | mS | 2.3 | 2 | 2.0-2.5 | 5.8 | Vāji skāba | 2.0 | 167 | Augsts | 120-180 | 152 | Vidējs | 160-200 | nav analizēts | | 0.93 | Laba |
| 94920070139 | 3 | 4.60 | Tīrumi | Pgv | mS | 2.3 | 2 | 2.0-2.5 | 5.3 | Vidēji skāba | 4.0 | 96 | Vidējs | 120-180 | 143 | Vidējs | 160-200 | nav analizēts | | 0.79 | Vidēja |
| 94920070139 | 4 | 4.10 | Tīrumi | Pgv | mS | 2.3 | 2 | 2.0-2.5 | 5.1 | Vidēji skāba | 4.8 | 99 | Vidējs | 120-180 | 132 | Vidējs | 160-200 | nav analizēts | | 0.76 | Vidēja |
| 94920070139 | 5 | 3.90 | Tīrumi | Pgv | mS | 2.3 | 2 | 2.0-2.5 | 5.4 | Vidēji skāba | 3.6 | 173 | Augsts | 120-180 | 132 | Vidējs | 160-200 | nav analizēts | | 0.87 | Laba |
| 94920070046 | 6 | 2.60 | Tīrumi | Pgv | mS | 2.5 | 2 | 2.0-2.5 | 5.5 | Vidēji skāba | 3.2 | 95 | Vidējs | 120-180 | 204 | Augsts | 160-200 | nav analizēts | | 0.86 | Laba |
| 94920070046 | 7 | 2.00 | Tīrumi | Pgv | mS | 2.7 | 3 | 2.0-2.5 | 5.2 | Vidēji skāba | 4.4 | 49 | Zems | 120-180 | 123 | Vidējs | 160-200 | nav analizēts | | 0.67 | Vidēja |
| 94920070046 | 8 | 2.90 | Tīrumi | Pgv | sM | 3.2 | 3 | 2.5-3.0 | 5.3 | Skāba | 7.0 @ | 40 | Zems | 130-190 | 160 | Vidējs | 180-240 | nav analizēts | | 0.65 | Zema |
| 94920070045 | 9 | 2.60 | Tīrumi | Pgv | sM | 2.5 | 2 | 2.5-3.0 | 4.9 | Stipri skāba | 7.0 @ | 38 | Zems | 130-190 | 130 | Vidējs | 180-240 | nav analizēts | | 0.55 | Zema |
| 94920070045 | 10 | 2.70 | Tīrumi | Pgv | sM | 2.5 | 2 | 2.5-3.0 | 5.0 | Skāba | 6.7 @ | 63 | Zems | 130-190 | 107 | Vidējs | 180-240 | nav analizēts | | 0.57 | Zema |

# Agro-chemical Evaluation of the Soil

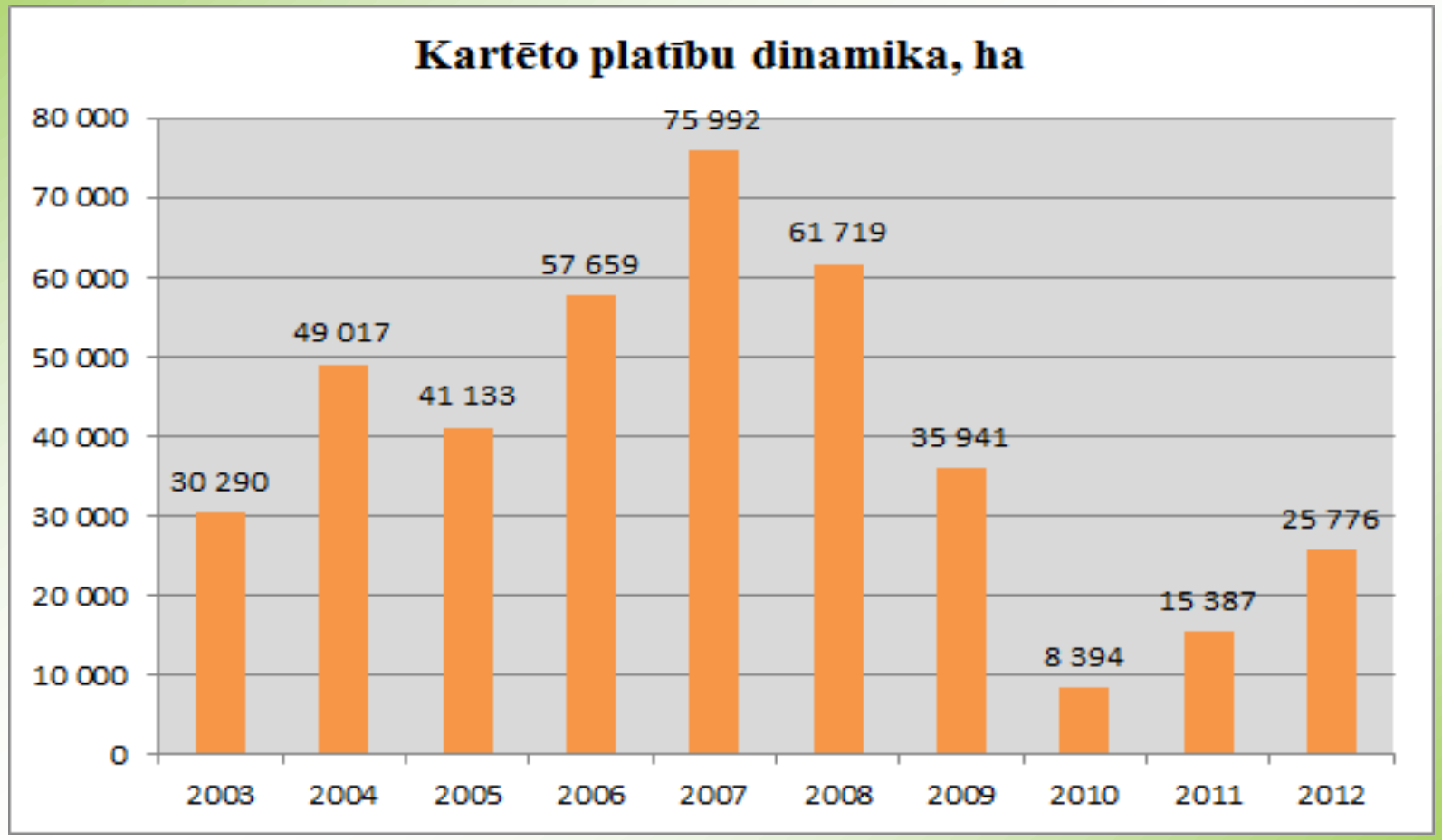
| Evaluation | Index | Reccomendations |
|---|---|---|
| **Low** | **< 0,65** | Soil agrochemical properties are poor, high yield is not possible |
| **Average** | **0,66 – 0,85** | Soil agrochemical properties are medium, high yield is possible, but uncertain |
| **High** | **> 0,85** | Soil agrochemical properties are good, high yield production is possible |

# State Planning Regions

## Agricultural Land (Cultivate) 1 983 000 ha

*Rural Support Service, 03.11.2010*

# The Dynamics of the Mapped area, ha



EIROPAS LAUKSAIMNIECĪBAS FONDS LAUKU ATTĪSTĪBAI:
EIROPA INVESTĒ LAUKU APVIDOS

# Organic Matter, ha %

| Organic matter content, % | 1995 *(VZD un ,,Ražība")* | 2012 *SPPS* |
|---|---|---|
| to 3,0 | 72 - 76 | 54,7 |
| 3,1 – 5,0 | 13 - 17 | **32** |
| above 5,0 | 10 | 9 |

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EIROPA INVESTĒ LAUKU APVIDOS

# Acidity, hectare %

| **Acidity, $pH_{KCl}$** | **1995** *(VZD un ,,Ražība")* | **2012** *SPPS* |
|---|---|---|
| **to 5,0 –** strongly acidic and sour | **8 – 10** | **9,4** |
| **5,1 – 6,0 –** weak and moderate acid | **26 – 34** | **41,7** |
| **above 6,1 -** normal | **56 - 64** | **49** |

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EIROPA INVESTĒ LAUKU APVIDOS

# Phosphorus, ha %

| Group | 1995 *(VZD un ,,Ražība")* | 2012 *SPPS* |
|---|---|---|
| **Very low and low** | **37** | **48,8** |
| **Average** | **33** | **35,2** |
| **High and very high** | **29 - 30** | **16** |

EIROPAS LAUKSAIMNIECĪBAS FONDS LAUKU ATTĪSTĪBAI:
EIROPA INVESTĒ LAUKU APVIDOS

# Potasium, hectare %

| Group | 1995 *(VZD un ,,Ražība")* | 2012 *SPPS* |
|---|---|---|
| Very low and low | 18 – 21 | **25,9** |
| Average | 48 – 51 | 60,0 |
| High and very high | 30 - 31 | 14,0 |

# Conclusions

1. **Latvian agricultural land has had a tendency to acidification of soil**

2. **Agricultural land is generally poorly served by phosphorus**

3. **Potassium available for plants in soil tends to get worse.**

# Fertilisation Norms

1. **On the basis of the runoff the nutrients from the soil according to the planned yield *(balance method)***

2. **Using a specific normative tables, drawn up on the basis of experimental data obtained**

***Lauku kultūraugu mēslošanas normatīvi.***

*Sastādītāji A.Kārkliņš un A.Ruža, Jelgava **2013**: LLU, 2013.-55 lpp.*

3. **Using the software provided by different services**

# Conditions for the Proper Application of Fertilisers

- **Financial assistance to the SAR** *(grants, technical assistance, etc.)*
- **Fertilising norms** to crops, vegetables, fruit trees and berry bushes
- **Agricultural education** for people who manage agricultural land

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Tashkent on 5-6 June, 2014

# Thank you for your attention!