



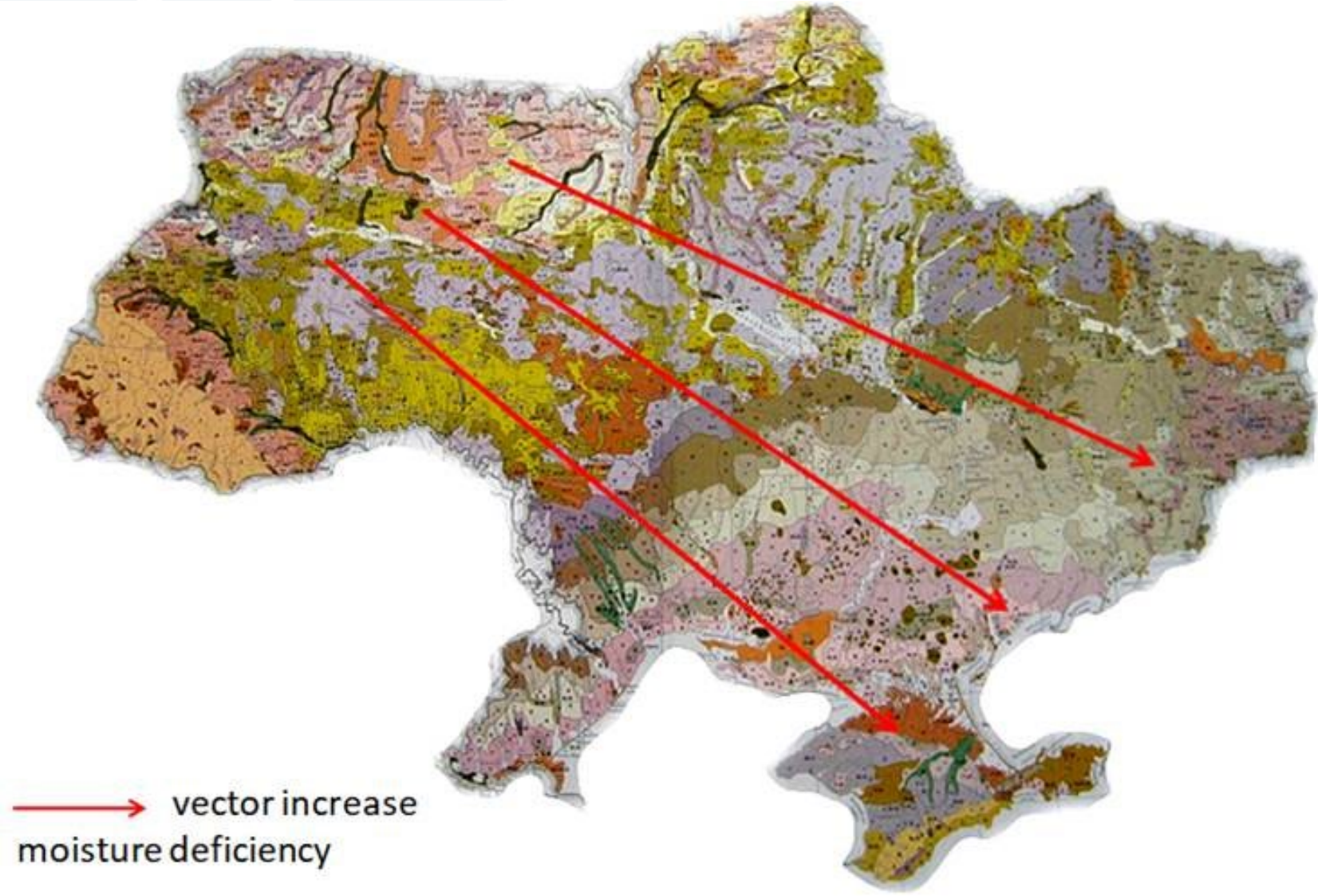
Increasing the efficiency of Ukrainian
agriculture in arid conditions
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Global Symposium on Soils for Nutrition | 26-29 July 2022



Soil map of Ukraine



→ vector increase
moisture deficiency

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UKRAINE NATURAL AND CLIMATIC ZONES

**Forest
(Humid,
25% of the territory)**

**Forest-Steppe
(Insufficiently humid,
35% of the territory)**

**Arid Steppe
(Arid,
40% of the territory)**

CLIMATE CHANGE IMPACTS

The area of the arid zone increased by 8 million ha (13%)

The probability of dry years has increased (6-8 years out of 10 are dry in the south of Ukraine)

The area of humid lands decreased by 10 million ha (16%)

DATA USED

(for an assessment of the efficiency of Ukrainian agriculture in arid conditions):

- National Scientific Center "Institute for Soil Science and Agrochemistry Research named after O.N. Sokolovsky" of the National Academy of Agrarian Sciences;
- Geographical network of experiments of the state agrochemical service;
- The Institute of Irrigated Agriculture of the National Academy of Agrarian Sciences;
- The Institute of Vegetable and Melon growing of the National Academy of Agrarian Sciences.



Effect of fertilizer and dry conditions on yield

VARIANT	YIELD
without fertilizers, without irrigation	- 40-70 %
mineral fertilizers, without irrigation	- 25-30 %
mineral and organic fertilizers, without irrigation	-5-7 %
mineral and organic fertilizers with irrigation	+50-100%

Wheat water consumption coefficient

VARIANT	Water consumption coefficient, m ³ /t of grain
without fertilizers	526
phosphorus-potassium fertilizers	496
nitrogen-potassium fertilizers	446
complete mineral fertilizer (NPK)	336



Distribution of irrigated lands in Ukraine by natural areas

Zone, subzone	Irrigated land, % of total area of irrigation
Polissya	1,0
Forest Steppe	13,6
Step Northern	31,4
Step Southern	30,5
Steppe Dry	23,0
Carpathian mountain region	0,5



Soil cover of Ukrainian irrigated lands

SOIL		Area, thousands of the hectares
In the national classification	In the international classification(WRB)	
Podzolic chernozems	Chernozems Albic	50,0
Typical chernozems	Chernozems Chernic	230,0
Ordinary chernozems	Chernozems Chernic	720,0
Southern chernozems	Chernozems Chernic	566,0
Meadow chernozems	Phaeozems Haplic	99,0
Soddy-podzolic soils	Albeluvisols Umbric	7,9
Light grey forest soils	Albeluvisols Umbric	40,2
Dark grey podzolized soils	Phaeozems Albic	26,0
Dark-chestnut soils	Kastanozems Haplic	384,6
Chestnut solonetzic soils	Kastanozems Luvic	10,0
Meadow-chestnut solonetzic soils	Phaeozems Sodic	54,7
Chestnut solonetz	Solonetz Humic	5,5
Total area		2193,9

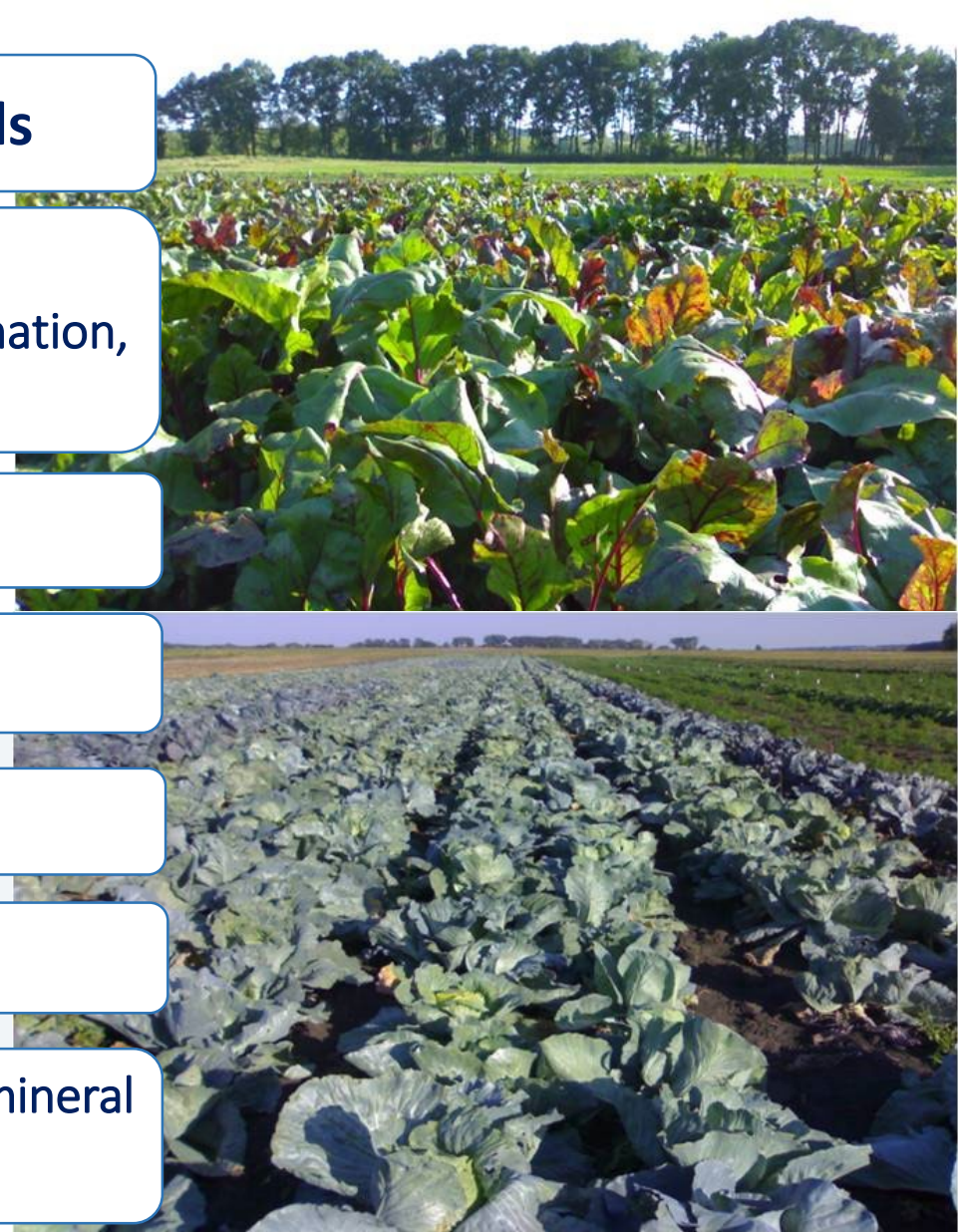


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Main Factors of Fertilization System on Irrigated Lands

- ✓ assessment of the current ecological and agro-reclamation state (complex of hydrogeological, engineering-geological, soil-reclamation, agronomic and environmental-toxicological indicators)
- ✓ nutrient content in the soil (and the ratio with their optimal content)
- ✓ nutrient removal by the planned harvest
- ✓ optimization of terms and methods of fertilization
- ✓ preventing the possibility of nitrate migration into groundwater
- ✓ the possibility of combining irrigation with the application of mineral fertilizers, herbicides, ameliorants and microelements



The concept of fertilizer application in irrigated agriculture

- ✓ doses of fertilizers are calculated depending on the agrochemical indicators of soils (on the levels of availability of mobile nutrients for the corresponding phases of crop vegetation)
- ✓ fertilizers are applied to the soil in the most efficient way, mainly locally, which ensures the highest payback per unit of the active substance in terms of yield growth
- ✓ doses, timing and methods of applying fertilizers are optimized depending on the level of fertilizer of the predecessor (primarily on the timing and rate of applying organic fertilizers in the crop rotation)
- ✓ first of all, mineral fertilizers are applied on irrigated and chemically reclaimed areas
- ✓ fertilizers have the highest efficiency on crops protected by the use of pesticides from weeds, pests and diseases
- ✓ on irrigation saline, solonetzic and residually solonetzic soils, potash and chlorine-containing types of mineral fertilizers should not be used





Thank you !

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