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Prospects for Agricultural Development and Environmental Improvement in the Aral Sea Region Using Biotechnology from Hybrid Innovation AGRO

Dr. Vadim SOKOLOV
Vice-President of International Commission on Irrigation and Drainage,
Head of Agency for Project Implementation of the International Fund for Aral Sea Saving in Uzbekistan

Nikolaj SOROKIN
Director of the AgenSysThem AG, Coordinator of the Hybrid Innovation AGRO Projects, Switzerland

10 October 2025
Session B3: Innovations in Water Use and Recycling for Food Systems

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Session B3: Innovations in Water Use and Recycling for Food Systems

1. Analysis of the critical situation in the Aral Sea region environmental crisis zone





•The Aral Sea and the lower reaches of the Amu Darya and Syr Darya rivers have become shallow, and coastal ecosystems have been destroyed.
•Desertification of previously fertile lands is occurring, with the vast Aralkum Desert forming in place of the Aral Sea.
•Agriculture, livestock farming, and fisheries are underdeveloped in the region.
•Due to poor water quality, spread of disease, and job losses, the population is leaving.

Soil salinization and water shortages are the main reasons for the low standard of living in the Aral Sea region!

2. About cooperation between the Agency of IFAS and the Hybrid Innovation AGRO Group of Companies. Finding solutions to environmental problems in the Aral Sea region

While monitoring numerous projects and searching for new solutions for desalinating saline soils and desalinating saline groundwater and wastewater, IFAS experts noted **the unprecedented results of the practical application of bio-products for agriculture** developed by the Hybrid Innovation AGRO Group of Companies from Germany, Switzerland, and England in the Republic of Uzbekistan in 2023-2024.



A Memorandum of Understanding was signed in Tashkent on July 18, 2024, under which **large-scale field experiments** will begin in the Aral Sea region in 2025 to grow cotton, rice, and winter grains on saline soils, including highly saline fields that **had long been considered unviable for agricultural use**.



3. About field experiments of Hybrid Innovation AGRO bio-mixtures in 2023-2025

The results of experiments of Hybrid Innovation AGRO bio-mixtures conducted in the Republic of Uzbekistan were unexpected for both farmers and experts:

Khojeyli District of the Republic of Karakalpakstan, 2023-2024:
Experiment Coordinator: **Mr. Samvel Mkrtchyan (technical expert**, Hybrid Innovation AGRO Group of Companies). After autumn pre-sowing treatment of highly saline soils with bio-mixtures, farmers were able to obtain a high winter wheat yield of 5,0 t/ha, with a Class II quality (high gluten content).

Tashkent, Syrdarya, Namangan, and Bukhara Regions, 2023-2024:
Farmers used Hybrid Innovation AGRO Aktiv Plus (herein after **Aktiv Plus**) for three-time treatment of cotton leaves. Yield increase up to 30%.

Khiva district of Khorezm region:
Field testing of the bio-product Aktiv Plus on cotton plots with highly saline soil (considered unsuitable for farming) showed a yield of 5.1 t/ha.

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4. About the Hybrid Innovation AGRO Group of Companies and its goals in the Republic of Uzbekistan

Details of the Group of Companies, the details of scientific experiments and their sensational results are presented in the report prepared by Coordinator of the international Hybrid Innovation AGRO Project, one of developers of the innovative bio-mixture Aktiv Plus - **Mr. Nikolaj Vladimirovich Sorokin** (AgenSysThem AG, Zug, Switzerland):

Head Office:
SkyWood LTD,
124 City Road, London EC1V 2NX, United Kingdom
Phone +44 79 9998 8538

Office in Germany:
Hybrid Innovation Gmbh
Ulmenstrasse 77 E, 40476 Düsseldorf, Germany
Phone +49 176 8925 4527

Office in Uzbekistan:
Hybrid Innovation AGRO Trade CA
Mirzo-Ulugbek district, Elobod MSG, house 1, Tashkent, Uzbekistan
Phone +998 99 111 53 24

sky@hybrid-innovation-agro.de hybridinnovationagrouzb@gmail.com

Our mission is to improve agricultural practices, produce, and distribute a new generation of bio-products based on live microalgae and pure organic acids. These products are designed to support both conventional and organic farming, help restore soil fertility, desalinate saline groundwater and wastewater, and promote innovative agricultural technologies worldwide.

Our companies are further motivated by remarkable achievements of 2023–2025, which have attracted attention of environmentalists, scientists, and farmers worldwide. A pilot experiment in the Aral Sea ecological crisis zone demonstrated the exceptional effectiveness of the bio-product Hybrid Innovation AGRO **Aktiv Plus**.

The results? A significant reduction in sodium chloride (NaCl) levels in saline soils—from 70% to just 16%—and impressive yields of winter wheat, cotton, and rice in fields with high salt content!

sky@hybrid-innovation-agro.de hybridinnovationagrouzb@gmail.com

5. About high cotton yields grown on saline soils in the Khorezm region

An experiment on growing cotton on saline soils without leaching.



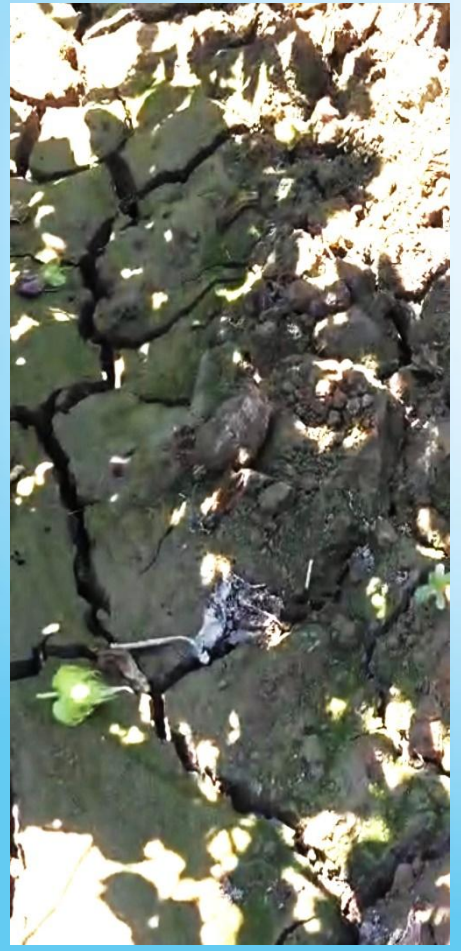
Location: Khorezm Region, Khiva District, Rahim Bergan Khodji Ambar Farm.

Initial data: Experimental Field #1, 3 hectares in size, with highly saline soil (previously considered unsuitable for farming). The field was not leached of salt in the spring. Drip irrigation was not used. Soil moisture retention film was not used. Experimental Field #2, 7 hectares in size, was leached of salt in the spring. Drip irrigation was used. Soil moisture retention film was used.



Experimental sample: Hybrid Innovation AGRO Aktiv Plus, a bio-mixture of live microalgae and organic acids (produced in Uzbekistan under license from Hybrid Innovation GmbH, Germany, since 2025).

5. About high cotton yields grown on saline soils in the Khorezm region



The purpose of the experiment was to practically confirm the effectiveness of the Aktiv Plus bio-mixture.

The principle of operation is that the soil is treated with a solution of water and the Aktiv Plus bio-mixture. Under the influence of sunlight, living microalgae begin to actively reproduce, enriching the soil with oxygen and absorbing salt from the soil.

Ultimately, through complex biochemical processes at the cellular level, the salt is converted into an organic mass of macro- and microelements, which provides plants with bioavailable nutrition and is easily absorbed by the roots.

The green color of the soil indicates the intensive reproduction of living microalgae, for which chemical compounds in the salt serve as a nutrient medium.

Features of using the Aktiv Plus bio-mixture:

- **Soil desalination:** Live microalgae contained in the bio-mixtures absorb NaCl through biochemical reactions and convert it into microelements that are safe for the environment and beneficial for plant growth.
- **Increasing the humus layer:** Microalgae actively reproduce, absorbing carbon dioxide, enriching the soil with oxygen, bioavailable nitrogen, and other macro- and microelements necessary for root development.

• **Moisture holding:** A protective screen of mucus formed by large quantities of living algae reflects sunlight, thereby conserve moisture in the soil for the roots.



Cumulative effect: **Aktiv Plus** organic fertilizer is applied to saline soil only once before sowing seeds (in autumn or spring), but thanks to the proliferation of algae, the soil again receives the products of their processing in the form of humus.



• **Results of field experiments:**

- Experimental Field No. 1 (without spring water leaching to remove salt) received a cotton yield of 5.1 t/ha.
- Experimental Field No. 2 (with water leaching, film, and drip irrigation) yielded over 7.1 t/ha.
- The average weight of one cotton boll in the experimental fields was 6-7 gram

• **Outcomes:**

Bio-technology of the Hybrid Innovation AGRO:

- they help conserve water for irrigating cotton;
- help desalinize highly saline soils;
- promote the reclamation of salt marshes.

Laboratory analysis of soil from experimental field No. 1 (without secondary soil leaching)

Date of sampling	28.04.2025	21.07.2025
P2O5 (mg/kg)	22.41	14.32
K2O (mg/kg)	485	197
Humus %	1.33	1.33
pH	7.1	7.6
Ca (mg/ekv.)	3.2	3
Mg (mg/ekv.)	1.6	4.5
Dry residue	0.506	0.413
Cl Ion	0.08	0.05

6. Aktiv Plus – saving up to 4 billion m^3 of water resources per year

Field experiments in Khorezm demonstrated the ability to harvest cotton at a yield of approximately 5.0 ton per hectare without spring leaching.

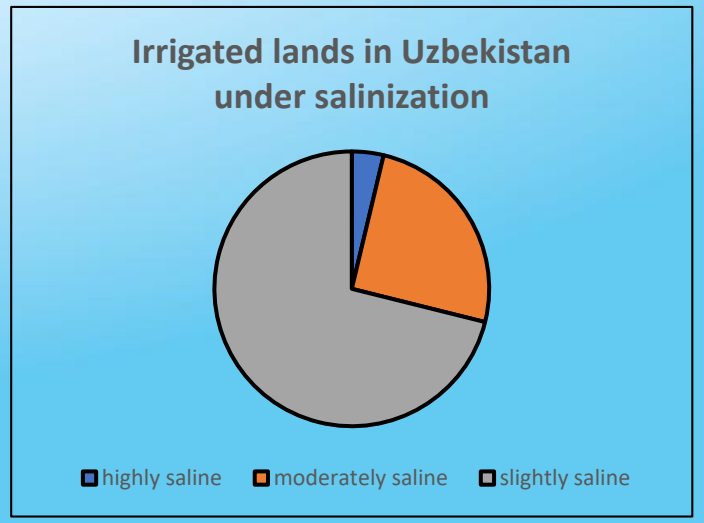
Treating saline soils with the Aktiv Plus bio-mixture will allow, without compromising cotton yield or it's quality

to reduce water consumption by 4 billion cubic meters per year.

The basis for this savings calculation is statistical data:
- In 2025, 1,746,600 hectares of land in Uzbekistan are subject to salinization, including: 65,200 hectares of highly saline land, 439,400 hectares of moderately saline land, and 1,242,000 hectares of slightly saline land.

- average water consumption used for one cycle of leaching cultivated fields (Amu Darya and Syr Darya)

- Slightly saline soils - about 1 500–3 000 m^3/ha,
- Moderately saline soils - abouto 4 000–5 000 m^3/ha,
- Highly saline soils - about 8 000–12 000 m^3/ha and more.



7. Impact of Hybrid Innovation AGRO technologies on the ecology of the Aral Sea region

Using the Aktiv Plus bio-mixture will:

- Reduce water consumption from the Amu Darya and Syr Darya rivers for leaching of saline soils;
- Restore soil fertility;
- Increase crop yields and improve quality of agricultural products;
- Transition to organic farming;
- Improve environmental health;
- Improve the standard of living of millions of people.

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Hybrid Innovation AGRO Group of Companies sincerely hopes for your interest in our proposals and your willingness to participate in a round table with the management **Hybrid Innovation Agro Trade CA** (representative office of the Group in Uzbekistan):

Phone: +998 99 111 53 24

E-mail: hybridinnovationagrouzb@gmail.com

Head Office:
SkyWood LTD,
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Thank you for attention!
We are looking for productive cooperation





Savitsky Museum in Nukus:
The Art that Makes Us Better



«Viam supervadet vadens cunctim»

Walk together and you shall reach

Agency of IFAS is located at:
Karasu-4, building 11 (5th floor), Tashkent city, 100187
Tel. (+998) 555-031-356
E-mail : info@aral.uz ; vadim_sokol@mail.ru