

3rd Global Summit on Climate Changes and Sustainability

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Chemical-Soil-Biological Engineering and Biogeosystem Technique Methodology in Ecosphere Sustainability

Current outdated technological platform of a chemical, environmental and agricultural management causes an "Ecosphere – technology" conflict. A core of this platform is the natural phenomena simplified imitating in technology. Generally accepted technologies lead to ecosphere loading adverse consequences. Poor soil geophysical system and fertility under the uncontrolled soil management, irrigation and chemical waste deposition reduce the soil productivity, and influence badly the ecosphere health and sustainability amplifying a climate change.

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An essence of an environmentally sound technological development niche has been revealed on a qualified heuristic approach basis. As a result, a chemical-soil-biological engineering (CSBE) and Biogeosystem Technique (BGT*) methodology was developed.

CSBE-BGT* objects and capabilities are: a main product chemical-technological system; a soil illuvial layer structure and architecture synthesis; a pulsed intra-soil sequential-discrete devices for soil moistening, the liquid by-product and/or soil recycling and plant nutrition; a waste-free bulk or granular by-product soil-biological recycling within the soil inner layer synthesized fine-aggregate architecture; plant favorable development; and an environmentally friendly biological production.

A one-time 20–50 cm layer intra-soil milling provides a long-term stable soil fine multilevel aggregate system improving a soil biome function for up to 40 years. An intra-soil pulse sequential-discrete watering reduces a plant water consumption circa 5–20 times compared to generally accepted irrigation. Municipal, industrial waste and gasification byproduct intra-soil dispersed recycling in a course of a 20–50 cm soil layer milling provides the soil solution equilibria control, heavy metals passivation, environmental safety and plant nutrition. The yield becomes higher for 50–80% compared to generally accepted technology. CSBE-BGT* methodology promotes the soil system continuity, reinforces soil biogeochemical turnover, ensures soil high quality, provides balanced soil moistening and water saving, procures reversible carbon intra-soil and aboveground biological sequestration, waste free, environment friendly circular green chemistry, biosphere health and climate system sustainability.

Biography

Professor Dr Sc (Biol) Valery P. Kalinitchenko. Candidate of Science Degree from Moscow State University, in 1984. Doctoral of Science Degree from Moscow State University, in 1991. Don State Agrarian University, Agriculture and Land Reclamation Department Chair, Persianovka, Russia, in 1976-2012. Institute of Fertility of Soils of South Russia Persianovka, director, from 2003 till now (Founder), and All-Russian Phytopathology Research Institute, Big Vyazemy, Russia, leading researcher from 2016 till now. Research interests: 45 years of experience in soil and water sustainable use and resource conservation including soil fertility, water saving, waste recycling, biosphere sustainability, technology in soil high productivity and health, and soil chemical equilibria. Developed Biogeosystem Technique and Chemical-Soil-Biological Engineering. Received the Vernadsky Fund Award (2008). Author: 700 monographs, journal and conference papers and 50 patents, supervised 17 doctoral theses. Member of leading scientific societies including the European Geosciences Union, Eurasian Soil Society and the American Chemical Society. Serves on international journal boards. Editor-in-Chief: Biogeosystem Technique