

## АКТУАЛНО

### БИОРАЗНООБРАЗИЕ В ЗЕМЕДЕЛИЕТО

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ВИСШЕ УЧИЛИЩЕ ПО АГРОБИЗНЕС И РАЗВИТИЕ НА РЕГИОНИТЕ

### AGRICULTURAL BIODIVERSITY

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**Biodiversity, the variety and variability of animals, plants and microorganisms at the genetic, species and ecosystem levels, is necessary to sustain key functions of the ecosystem, its structure and processes. (1)**

Agricultural biodiversity is sub-set of general biodiversity. This includes all forms of life directly relevant to agriculture: livestock and crops, and many other organisms like weeds, pests, predators and organisms dwell in soils such as bacteria and cyanobacteria, worms, different kinds of algae that aerate soils.

Biodiversity in agro-ecosystems is very important not only for the production of food, but for different ecological services such as recycling of nutrients, local hydrological processes, regulation of microclimate of the region and detoxification of noxious chemicals.



Biologists have been described about 1 700 000 distinct biological species on Earth up to now. (2) According to FAO about 7,000 species of plants have been cultivated for consumption in human history.(1) This number includes 81 red, 54

brown, 25 green algal species and 8 cyanobacteria (blue-green algae) used for food by human and fodder for livestock.

Presently, only about 30 crops provide 95% of human food energy needs, four of which (rice, wheat, maize and potato) are responsible for more than 60% of our energy intake. (1)

#### **The importance of agricultural biodiversity for human**

Agriculture was first developed about 10 000 years ago and all crops and livestock use by people origin from natural biodiversity. Natural biodiversity is the basic of agriculture. Biodiversity is the foundation of all species of crops and livestock and the variety within them.

Agricultural biodiversity provides people not only with food, but also with materials for clothes such as cotton and lawn, materials for biofuels, medical herbs and roots for pills and drugs, wood for shelter and with incomes and livelihoods. It also supplies ecosystem services like air, water and soil conservation, maintains soil fertility, pollination, air quality, CO2 sequestration.

Genetic diversity of agriculture gives to the species ability to react against high and low temperatures, frost, drought, climate change, etc. It also provides species with their resistance to particular pests, invasive species and diseases.

#### **The ecological role of biodiversity in agro-ecosystems**

##### Nitrogen fixation

Nitrogen is the most abundant element in our atmosphere – about 78%. It is a vital element as many compounds essential to living creatures. Nitrogen fixation is one process by which molecular nitrogen is reduced to form ammonia.

This complex process is carried out by nitrogen-fixing bacteria and cyanobacteria dwell in the soils.

### Pollination

There are over 120 000 species, insects such as bees, butterflies, beetles, flies and some birds that are pollinators. Pollination is a process that plays a great role in agro-ecosystems. The ecological and financial importance of natural pollination by insects to agricultural crops, improving their quality and quantity. These natural pollinators have to be preserved from pesticides used by humans in agro-ecosystems.



### Soil and water aeration

Different kinds of species that inhabit soil (bacteria, cyanobacteria, mosses, algae and worms) have a great ecological role as aerators of the soils. For example, tunnels made by worms aerate soils and allow rain water to reach the roots. These soil dwellers also create organic matter of soil surface.

### Pest control

Lots of agricultural pests have natural enemies that control pest populations. Predator insects, parasitic wasps and flies and some microorganisms play a great role in controlling pests in agro-ecosystems.

The human's benefits by biodiversity can be arranged in several groups:

**Ecosystem services** such as cycling of nutrients and chemical ingredients (nitrogen, hydrogen, oxygen, phosphorus, sulphur), primary production, soil creation, water purification, regulating of local climate, etc.

**Supply with** food, fresh water, biofuel, shelter, wood for industry, different goods, etc.

**Cultural** - educational, recreational, aesthetic.

**Human health** drugs, pills and herbs.

All of the above mentioned benefits are basic for human well-being.

### **References:**

1. UN Food and Agriculture Organization. (2012) <http://www.fao.org/index.php?id=24757>
2. Current Results Nexus (2004-2012). Number of species identify on Earth. <http://www.currentresults.com/Environment-Facts/Plants-Animals/number-species.php>
3. Convention on Biological Diversity <http://www.cbd.int/agro/importance.shtml>