

Integrated agricultural planting protection systems as a determining factor of the environmental sanitation

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For a comparatively short period of an agriculture existence, mankind realized only two agricultural nature management stages – extensive, lasted for a thousand years and intensive – lasted for decades of years. Now, on the threshold of the third thousand years, mankind should proceed along the path of the ecologic, adaptive agroindustrial complex development to survive. The second UNO International conference on the environment and development was a powerful incentive. The conference discussed the global strategy of the balanced earth civilization development in the XXI century.

Necessity of an overcoming the negative consequences of chemical, man-caused agriculture intensification is the reason of basing a brand new adaptive agriculture intensification strategy or adaptive strategy (Zhuchenko, 1994). The adaptive strategy realization – is an indispensable condition of “survival” and “stable development” of the earth civilization.

Theoretical footing of the hazardous organisms’ number regulation in the agroecosystems is an idea that in the natural biocenoses, epiphytotics and invasions do not accumulate catastrophic character of the biotic stressors effect. The biotic stressors function according to the principle of feedback that can be positive or negative. The species can have compensatory reactions on the changes of their population number – medium specific mechanism or populations of the other species – biocenotic mechanism (Mitrophanov et al., 1995, Drozda 2001).

An artificial selection, on the whole, decreases the adaptive autotroph capacity – producer, at the same time as a natural selection increases its adaptive potential. The reason of a phenomenon is in selection, directed on a high productivity and, as a rule, accompanied by decreasing of a general and specific ecological resistance of the species and hybrids. At the same time, the natural

selection effect in agroecosystems remains while performing the function of destabilization. In particular, devastating epiphytotics and invasions of the pests – is a result of the natural selection, provoked by the man. Agroecosystems can be characterized by a complicated phytosanitary situation. These are entirely or partly closed agroecosystems, or opened ecosystems of the intensive agriculture, that annually undergo a compulsory succession, or the perennial planting.

An integrated plant protection – is a main component part of the ecologic plant protection. Under the condition of the researches intensification, this should be an essential contribution to the ecologic plant growing system. On the example of the perennial fruit planting protection, we (Drozda 1996, 1999, 2000, 2001) formulated the conception of the grain gardens biological protection, adapted to the landscape gardening of Ukrainian Lisostep – a component part of the integrated technology. Here were determined the main destabilizing factors and illustrated the estimation of their influence on an entomo- and phytophages composition. We pointed out the main principles of a phytosanitary apple-tree agrocenosis control. The formalized analyses, based on an ecosystem approach, allowed formulating the biocenotic general conception of the entomophages and entomopathogens role, as one of the regulatory mechanisms of the agrocenosis functioning and thereupon to prove the principles of the lepidopterous pests entomophages use in the systems of an integrated protection of the orchards. Their essence is in the ecosystem programming of the number, biotic potential and phytophage population dynamics, on the certain succession period and is determined by the particular features of an artificial agrocenosis formation. The phytophage populations are not controlled by the entomophages and entomopathogens, representatives of a higher trophic level and are self-regulating by their existence trophic base. Biocenotic effect of the agrocenosis lies in maintaining of the specific and quantitative consumer-phytophages, entomophages and entomopathogens composition by the plant phytoassociation set. Controls vector between ecosystem components and power flow in the trophic chain directed exactly in the same way. According to the original hypothesis, there is a generalized mechanism that transfers ecologic

information concerning environmental aspects into physiologic one, coded by the species composition and phytohormones concentration. The last ones, as it was determined by the researches, synchronize seasonal plant growth with an insect growth. This structure provides the most favorable form of the informational contact with an environment. It was determined the biological essence of the artificially propagated entomophages use strategy, as the means directed on the weakened or the missing ecological relationships renewal. We worked out methods of pro-, epi and synovigenic entomophages complexes growing and using technologies, by directive effect on them with the original compounds of the native and modified DNA and RNA, their analogues and predecessors, by no vectorial transfer of the inheritable information that increase a reaction norm within genetic program of the species. It is determined their role and place in the orchard protection technologies. It is based the original growing technologies of the mass insects, as the entomophages hosts and environment for entomopathogens growing. The developments protected by a whole range of the author's certificates and patents.

In particular, as a composite part of the integrated orchard protection system, we offer combined, gradual use of the chemical insecticides in the early spring, harmless for the entomophages, pollinators and environment as a whole. We used the biological preparations against dominating lepidopterous phytophages. It is offered the original technology of pecilomin preparation use against ranging caterpillars of the leaf-roller moth, its efficiency in the reactivation period of the pest was 75,4-88,6%. In combination with the use of specialized trichogramma forms and bacterial preparations, during the vegetation period are used only biological methods. Founded technology of a gaupsin use – biopreparation on the bacterium of *Pseudomonas* species, is highly effective both against the leaf-roller moth complex, and pathogenic organisms, especially, scab.

We consider each method as an element of the grain gardens integrated system. The original systems oriented on the dominating species of phytophages complex and methods that are able gradually inhibit different growth stages of the

pests – eggs, active and ranging caterpillars, pupae, and pathogenic organisms too. Any of these methods do not guarantee the garden protection. Moreover, modifying effect is inherent only to some of them (parasites, vermin, entomopathogens). But cumulative effect, as a result of their integration, is fully acceptable according to the biologic and agricultural efficiency indexes. It is important that in the phytophages extermination strategy, as a usage of chemical means and obtaining of a short-term effect, we offered an alternative variant – maximal complex use of the biological means, and as a result, the arrangement of conditions when dynamic interaction of the arthropoda complex achieves self-regulation level at biocenotic mechanism functioning. It is significant that directly used in the garden entomophages populations (species of Trichogramma family), were grown with a previous use of the original compounds, native and modified DNA and RNA, their analogues and predecessors. These are the fragments of high technologies that help along obtaining highly viable starting entomophages populations, competitive in agrocenosis.

Offered integrated systems consist of the single adaptable elements that can be completed, changed and used partially. First, they should be used in the specific regions, health resorts, holiday centers, and to garner the crop acceptable for children's and invalid food, in the regions polluted by man-caused waste products and radioactive nuclides.