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ФІТОСАНІТАРНА ЕКСПЕРТИЗА: ДОСВІД УКРАЇНИ ТА МІЖНАРОДНІ СТАНДАРТИ

Анотація. *У статті досліджується досвід України у проведенні фітосанітарної експертизи на основі міжнародних стандартів. Було заявлено, що Україна має розробити низку проектів національного законодавства у галузі карантину та захисту рослин, які будуть адаптовані до законодавства Європейського Союзу та одночасно відповідатимуть вимогам Міжнародної конвенції про захист рослин. У цій галузі Україна вже частково здійснила деякі структурні реформи у фітосанітарному секторі, але ці процеси вимагають постійної державної підтримки та заохочення, міжнародної координації, що сприятиме розвитку сільського господарства загалом. Така координація може здійснюватися насамперед у рамках міжнародних універсальних організацій в системі ООН, зокрема в рамках ФАО. Було наголошено, що Закон України № 2501-VIII «Про внесення змін до деяких законодавчих актів України щодо врегулювання проведення деяких фітосанітарних процедур» набрав чинності 2 лютого 2019 року. Серед нововведень – надання права на здійснення експертної експертизи приватних лабораторій, нові терміни у галузі карантину рослин і створення Реєстру виданих фітосанітарних сертифікатів. Зроблено висновок, що в даний час Україна активно застосовує міжнародні стандарти, бере участь у їх розробці та реєструє офіційні переклади міжнародних стандартів з фітосанітарних заходів. Розробка національних і застосування міжнародних стандартів, як ключового чинника створення системи якості в галузі карантину рослин, не лише забезпечує повне виконання Україною своїх зобов'язань за МКЗР та СФЗ, узгоджуючи фітосанітарну безпеку експортованих карантинних вантажів, але й також підвищує конкурентоспроможність українських рослинних продуктів на світовому ринку. Це створює позитивний імідж України як надійного торгового партнера, який не порушує вимог інших країн і гарантує відповідність якості продукції, фітосанітарних процедур міжнародно визнаним стандартам. Тому для кваліфікованих фітосанітарних експертиз перспективним напрямком повинен бути механізм гарантування відповідності національним та міжнародним стандартам, внесення змін до законодавства, запровадження ефективних покарань за порушення правил та порядку проведення фітосанітарних експертиз*

Ключові слова: *фітосанітарні процедури, фітосанітарний контроль, міжнародні стандарти, Світова організація торгівлі, Міжнародна конвенція про захист рослин*

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PHYTOSANITARY EXAMINATION: UKRAINE EXPERIENCE AND INTERNATIONAL STANDARDS

Abstract. *The article explores Ukraine's experience in conducting phytosanitary expertise based on international standards. It was stated that Ukraine should develop a series of draft in national legislation in the field of quarantine and plant protection, which would be adapted to the legislation of the European Union and at the same time meet the requirements of the International Plant Protection Convention. In this area, Ukraine has already partially implemented some structural reforms in the phytosanitary sector, but these processes require continued state support and encouragement, international coordination that will facilitate the development of agriculture in general. Such coordination can be undertaken primarily in the framework of international universal organisations within the UN system, in particular within FAO. It has been emphasised that Law of Ukraine No. 2501-VIII "On Amendments to Certain Legislative Acts of Ukraine on Regulation of Some Phytosanitary Procedures" came into force on February 2, 2019. Among the innovations are the granting of the right to carry out expert examination to private laboratories, new terms in the field of plant quarantine and the creation of the Register of Phytosanitary Certificates issued. It has been concluded that Ukraine is currently actively applying international standards, participating in their development and registering official translations of international standards for phytosanitary measures. Developing national and applying international standards, as a key factor in creating a quality system in the field of plant quarantine, not only ensure full fulfilment by Ukraine of its obligations under the IPPC and SPS, agreeing on the phytosanitary safety of exported quarantine cargoes, but also increase the competitiveness of the domestic vegetal products in the world market. This creates a positive image of Ukraine as a reliable trading partner that does not violate the requirements of other countries and guarantees the conformity of product quality, phytosanitary procedures to internationally recognised standards. Therefore, for qualified phytosanitary examinations, the mechanism of guaranteeing compliance with national and international standards, amending legislation, introducing effective penalties for violation of the rules and procedure for conducting phytosanitary examinations should be a promising area*

Keywords: *phytosanitary procedures, phytosanitary control, international standards, World Trade Organisation, International Plant Protection Convention*

INTRODUCTION

Membership of Ukraine in international organisations, in particular in the World Trade Organisation (hereinafter – the WTO), the International Convention for the Protection of Plants (hereinafter – the IPPC), the Food and Agriculture Organisation of the United Nations (hereinafter – the FAO), provides for mandatory observance of the basic principles and requirements in the field of quarantine and plant protection at the international level. In view of this, the State Consumer Service of Ukraine is actively working on the harmonisation and adaptation of national phytosanitary legislation to international norms and standards. Accordingly, the requirements for the level of work of the National Organisation for Quarantine and Plant Protection are increasing. Ukraine needs to develop a series of draft national legislation in the field of quarantine and plant protection, which would be adapted to European Union legislation and at the same time meet the requirements of the International Plant Protection Convention.

It is worth noting that Ukraine has partially implemented some structural reforms in the phytosanitary sector, but these processes require constant state support and stimulation, international coordination, which will

contribute to the development of agriculture in general. Such coordination can be undertaken primarily in the framework of international universal organisations within the UN system, in particular within the FAO. FAO's technical assistance, on the other hand, will enhance international phytosanitary cooperation between national quarantine and plant protection organisations. Thus, the revised International Standards on Phytosanitary Measures (ISPM) were adopted at the 13th session of the Commission on Phytosanitary Measures (2018): ISPM No. 5 – Glossary of Phytosanitary Terms; ISPM No. 6 – Supervision; ISPM No. 15 – Wood Packaging Regulation in International Trade (Appendix 1 – Approved Wood Packaging Approaches (2018) and Appendix 2 – Sign (Marking) and its Use (2018)); ISPM No. 42 – Requirements for the use of temperature treatments as phytosanitary measures [1]. Ukraine has also participated in the discussion and adoption of these standards. These standards are actively used by both quarantine and plant protection professionals and manufacturers to ensure that their products comply with international phytosanitary legislation. In addition, on February 2, 2019, Law of Ukraine No. 2501-VIII "On Amendments to Certain Legislative Acts of Ukraine Regulating the Implementation of Some Phytosanitary Procedures"[1] came into force. Among the innovations are the granting of the right to carry out expert examination to private laboratories, new terms in the field of plant quarantine and the creation of the Register of Phytosanitary Certificates issued[2]. The updated Act introduced a number of terms: arbitrage, recess, visual inspection, laboratory, pooled sample, review, party, medium trial, safe deposit box, etc. In particular, this Law stipulates that in some cases there may be a visual check when phytosanitary examination (i.e. analysis) is not carried out. And pest detection products are only examined using a magnifying glass, binoculars or a microscope. The concept of phytosanitary laboratory has also expanded. From now on, it is an institution of any form of ownership authorised by a public authority to carry out appropriate examinations and analysis.

According to the Law[3], private laboratory specialists were granted the right to carry out plant phytosanitary examination. However, only exporters can use these services. The owner of the cargo can choose in which laboratory to carry out an analysis – public or private. In order to use the services of a private laboratory, the exporter must inform the regional representatives of the State Consumer Service of Ukraine about: transport, cargo, date and time of the beginning of the analysis by specialists of a private laboratory. The fact is that a private laboratory can carry out the analysis on its own, but the state representative must monitor the sampling and inspection of a cargo. Then the samples are packed in safe packages, the state phytosanitary inspector signs the act on the sampling, so the products are sent for examination. Phytosanitary examination report is valid for 14 days.

The Law[4] also provides for the creation of an electronic register of phytosanitary laboratories. Access to the list will be open and public. It is planned that the Register of Phytosanitary Laboratories will include information on: the name and address of a phytosanitary laboratory with indication of the validity of its accreditation certificate; number and date of issue of the phytosanitary examination report (analysis). The state phytosanitary laboratories will automatically enter there. In addition to the electronic register of laboratories, a list of phytosanitary certificates is also planned. It will include information on exporters or producers of products, the volume of products produced, the date of issue of the phytosanitary examination report and the date of issue of the certificate itself.

Recently, a lot of scientific developments have been devoted to the problems of peculiarities of conducting various examinations, in particular commodity, sanitary-hygienic, veterinary-sanitary, ecological and customs examinations of goods in general and food products in particular. Many scientists and researchers study the methodology and technical features of expertise procedure, in particular, V.A. Makarov, V.P. Frolov, M.F. Shuklin, A.O. Kunakov, I.G. Seryogin, G.A. Talapov et al. Special attention should be paid to the scientific developments of V.I. Khomenko, V.L Shablii, N.K. Oksamitny, G.N. Kruglyakov, who have improved the methods and methods of performing examinations. V.V. Vlasenko, R.Y. Kravtsov, V.I. Khomenko and others in their studies considered the procedure of documentation preparation and discussed the effectiveness of expertise procedures. I.V. Gushchuk, E.G. Slautenko study the issues of water and air pollution, which directly affects the efficiency of crops. At the same time, the issues of substantiation and modern peculiarities of exactly phytosanitary examinations procedure deserve due attention.

The aim of the article is to consider and analyse the necessity of designation and peculiarities of carrying out phytosanitary examinations in modern conditions in Ukraine on the basis of international experience and international standards.

1. ANALYSIS OF ORGANISATIONS DEALING WITH PHYTOSANITARY EXPERTISE

Standardisation covers most areas of human activity. The WTO Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) places particular emphasis on the role of international standards in establishing a multilateral system of rules and requirements governing

1. Law of Ukraine No. 2501-VIII "On Amendments to Certain Legislative Acts of Ukraine Regulating the Implementation of Some Phytosanitary Procedures". (2018, July). Retrieved from https://zakon.rada.gov.ua/laws/show/2501-19.
2. *Ibidem, 2018.*
3. *Ibidem, 2018.*
4. *Ibidem, 2018.*

the development, adoption and application of sanitary and phytosanitary measures to minimise their environmental impact. Thus, Article 3 of the SPS Agreement refers to international standards[1]:

1) in order to harmonise sanitary and phytosanitary measures on a broader basis, members should base their sanitary and phytosanitary measures on international standards, recommendations, if any, unless otherwise provided in this Agreement, and in particular in paragraph 3;

2) sanitary or phytosanitary measures that are consistent with international standards, recommendations, are necessary for the protection of life or health of humans, animals or plants and do not contravene the relevant provisions of this Agreement and GATT 1994.

Of particular importance is paragraph 2 of Art. 3 of SPS agreements[2]. Taking into account the text of the preamble, the Agreement contains a direct reference to the standards developed by these organisations. The SPS Agreement establishes the rights of members to take the sanitary and phytosanitary measures necessary to protect the life or health of humans, animals or plants, which may be different from the standards set out in the Codex Alimentarius [2]. However, such a presumption is established: measures based on international standards meet the requirements of the WTO provisions, which may serve as a basis for protection in the event of a dispute [3]. This de facto speaks of the special status of the Codex Alimentarius Commission standards [2].

Also in 1952, a global instrument for the harmonisation of phytosanitary measures in commercial activities was created – the already mentioned International Plant Protection Convention (IPPC)[3], the secretariat of which oversees the development of IPPC. The IPPC activities, to which 177 countries have now joined, are part of the UN's global program on food and agriculture for plant quarantine policies and technical assistance. The main body of the Convention is the Commission on Phytosanitary Measures (CPM)[4], whose function is to approve international standards for phytosanitary measures.

The Regional Plant Protection and Quarantine Organisation (RPPQO) is an intergovernmental organisation that acts as the Coordinating Body of national quarantine and plant protection organisations at the regional level. There are now ten RPPQOs, but the development of regional standards is carried out by the following organisations: the European and Mediterranean Organisation for Quarantine and Plant Protection, whose standards cover phytosanitary regulations and plant protection products against pests; The North American Quarantine and Plant Protection Organisation, standards designed to protect agricultural, forestry and other plant resources; The South Cone Regional Phytosanitary Committee (COSAVE), which regulates plant protection issues of particular interest to Member States.

Some issues of standardisation in the field of plant quarantine are also addressed by the International Organisation for Standardisation (ISO), created in 1946 by 25 national standardisation organisations. Its purpose is to promote the development of standardisation worldwide to facilitate international trade and mutual assistance, as well as to enhance cooperation in the fields of intellectual, scientific, technical and economic activities. Ukraine has been a full member of ISO since 1993. Member of the Committees: CASCO, STACO, INFCO. A national committee member of the DEVCO, REMCO, COPOLCO. 25 TCs of the State Standard of Ukraine cooperate with 96 TCs and ISO PCs. Ukraine is actively involved in the work of the joint TC ISO/IEC STK1 "Information Technology", which was established in 1987.

2. FEATURES OF PHYTOSANITARY EXAMINATION IN UKRAINE

Ukraine actively applies international standards, participates in their development and registers official translations of international standards on phytosanitary measures. International Phytosanitary Standards cover a range of issues – the phytosanitary certification system, phytosanitary risk analysis, invasive alien species and pest control, and many other elements necessary for the effective functioning of the phytosanitary control system any country.

In addition, in recent years, information systems (technologies) in many countries have become increasingly widespread in agriculture that help producers manage technological processes competently, with the least risk. They are used in all fields of agricultural production, including in the field of plant protection. Phytosanitary, agroecological and economic diversity forces a large amount of information to be analysed when making decisions. In this case, it is no longer enough to only the monitor biological objects – their diagnosis and assessment of the intensity of development. In the conditions of multifactoriality of the analysed processes and multivariate decisions, not only phytosanitary diagnostics of diseased plants, but also their phytosanitary expertise is required. According to Art. 13 of the Law of Ukraine "On Plant Quarantine"[5], phytosanitary examination of regulated objects is carried out in order to find and/or identify regulated pests.

Phytosanitary examination is a system of phytosanitary, agroecological and agrometeorological observations and analysis, which allows to evaluate the current phytosanitary situation and to predict its development, including crop losses. Phytosanitary examination is provided by the central executive body, which implements the state policy in the field of plant quarantine, in accordance with

1. Agreement "On the Application of Sanitary and Phytosanitary Measures". (1994, April). Retrieved from https://zakon.rada.gov.ua/laws/show/981_006#Text.
2. *Ibidem, 1994.*
3. International Plant Protection Convention. (2006, January). Retrieved from https://zakon.rada.gov.ua/laws/show/995_805#Text.
4. *Ibidem, 2006*.
5. Law of Ukraine No. 3348-XII "On Plant Quarantine". (1993, June). Retrieved from https://zakon.rada.gov.ua/laws/show/3348-12.

international standards, instructions and recommendations. According to L. Baydakova, S. Naumenko, I. Baydakova [4], phytosanitary examination is an integral part of the state system of phytosanitary control in Ukraine. It is a set of measures aimed at protecting the territory and health of the population of Ukraine from the penetration from abroad of quarantine facilities, which can cause significant damage to the national economy of Ukraine.

The important principle of external plant quarantine is the prevention of the importation of quarantine pests to Ukraine. Many years of practice show that during phytosanitary control at border crossing points harmful organisms that are not present in the territory of our country are often found. Thus, during the period from 17.08.2019 to 12.09.2019, in the process of monitoring and inventory of old quarantine organisms, state phytosanitary inspectors found limited quarantine organisms in Ukraine, in particular:

American white moth (Hyphantria cunea Drury): in the Kirovograd region (in one area) on an area of 7 hectares; in the Odessa region (in six districts) on an area of 76.45 ha; in the Ternopil region (in one district) on an area of 0.2 ha; in the Kharkiv region (in four districts) on an area of 1.99 ha. Western corn rootworm (Diabrotica virgifera virgifera Le Conte): in the Volyn region (in six districts) on an area of 283.94 ha; in the Transcarpathian region (Beregovo and Chop) on an area of 15 hectares; in the Ivano-Frankivsk region (in one district) on an area of 215.25 ha; in the Odessa region (in four districts) on an area of 329 hectares. Potato scab (Synchytrium endobioticum (Schilbersky) Percival): in the Ivano-Frankivsk region (in two districts) on an area of 21.945 ha; in the Lviv region (in one district) on an area of 16.64 ha.

Golden potato nematode (Globodera rostochiensis (Wollenweber) Behrens): in the Volyn region (in one area) on an area of 2.94 ha; in the Ivano-Frankivsk region (in one district) on an area of 0.81 ha; in the Lviv region (in one district) on an area of 16.67 ha; in the Chernihiv region (in one district) on an area of 10.92 ha. Ragweed (Ambrosia artemisiifolia L.): in the Volyn region (in one area) on an area of 0.97 ha; in the Transcarpathian region (in three districts and three cities) on an area of 0.996 ha; in the Kirovograd region (in eight districts) on an area of 203.46 ha; in the Lviv region (in two districts) on an area of 0.98 ha; in the Mykolaiv region (in 16 districts) on an area of 1044.906 ha; in the Odessa region (in seven districts) on the area of 720.9 hectares; In the Rivne region (in 14 districts) on an area of 89.83 ha; in the Ternopil region (in two districts) on an area of 13.96 ha; in the Kharkiv region (in 16 districts) on an area of 307.976 hectares; in the Kherson region (in 15 districts) on an area of 807.97 hectares; in the Chernihiv region (Nizhyn) on an area of 1.025 hectares.

Cuscuta campestris (Cuscuta sampestris Yunck.): In the Kirovograd region (in three districts) on an area of 0.211 ha; in the Odessa region (in one district) on the area of 3.54 ha; in the Kharkiv region (in nine districts) on an area of 5.541 ha; in the Kherson region (in one district) on an area of 46 ha. Russian knapweed (steppe) (Acroptilon repens L.): in the Kherson region (in one area) on an area of 2.5 ha. Cenchrus (Cenchrus longispinus Fernald.): In the Kherson region (in one area) on an area of 2 ha [5]. These data indicate that the responsible link in the system of quarantine measures is the additional establishment of phytosanitary status of imported goods also at enterprises, since preventing the introduction into the country of quarantine organisms is easier and cheaper than localising and eliminating the outbreak of the pest. The State Plant Quarantine Service of Ukraine is responsible for protecting the territory of Ukraine from the penetration and spread of quarantine pests. Quarantine inspections of quarantine cargo by quarantine inspectors and laboratory examination of samples constitute a single interconnected process. Quarantine phytosanitary control starts from the State border of Ukraine.

The necessity for phytosanitary expertise by control bodies depends on the direction and method of moving the controlled goods. As a general rule, a state phytosanitary inspector is authorised to detain for inspection and examination controlled goods that are imported without a permit for phytosanitary control. In particular, in the absence of the carrier of the International Phytosanitary Certificate of the country of export, the cargo, in agreement with the State Food Safety and Consumer Protection Service, may be detained for issuing a quarantine permit with preliminary examination and examination. If the transported goods have not been inspected during their movement across the state border, they will be subject to phytosanitary examination in the customs territory of Ukraine.

However, before the examination, the care of plant products and other quarantine materials is possible. It is proved practically that the speed and reliability of laboratory examination to determine the presence and species composition of pests, pathogens and weeds in the test material, the correct assessment of their potential dangers and the economic importance of quarantine measures depend on the detail of the development and skilful use of quarantine care. Laboratory examination of sub-quarantine materials covers: carrying out analyses for the detection of pests, plant pathogens, seeds of dangerous weeds. It consists of the following stages: entomological, mycological, bacteriological, phyghelminthological, virologic and weed herbage; determination of species belonging to the detected harmful organisms; the conclusion of the specialists of the laboratory on the potential danger of harmful organisms and the introduction of phytosanitary measures in their control. The results of the examination of each sample, carried out depending on the complexity of the analysis by laboratory specialists or inspectors, determine the phytosanitary status of the entire consignment and recommend certain phytosanitary measures [6]. Phytosanitary examination is carried out directly by phytosanitary laboratories, which are located in every region of Ukraine. Functional flowchart of phytosanitary examination covers four main stages: I – diagnostics of dangerous harmful objects; II – phytosanitary monitoring; III – examination of phytosanitary risks; IV – decisions making about plant protection [7].

National plant protection organisations, carrying out phytosanitary risk analysis (hereinafter referred to as

PRAs), should rely on biological and other scientific and economic data in accordance with relevant ISPMs[1]. When performing PRAs, it is also necessary to consider the threats to biological diversity that result from the impact on plants. It is the latest advances in science, technic and technological advances in electronics and information technology that allow to quickly receive and analyse any amount of necessary information. Express methods of diagnostics of harmful microorganisms (express test systems, computer diagnostics, etc.), field microcomputers, automatic weather stations, satellite navigation systems, electronic data warehouses, operational satellite weather maps, geo-information phyto-landscape maps, etc. are now widely available.

The most difficult and responsible stage of adaptation of such systems is the examination of phytosanitary risks. It is based on mathematical, logical, empirical or other modelling of the processes of development and spread of harmful organisms and their loss of harvest against the background of difficult agroecological conditions. Model-based algorithms are the basis for creating computer programs and decision-making systems for plant protection. In the process of performing each stage of phytosanitary examination, many indicators are considered and analysed. For example, when examining cereals affected by only one disease, it is necessary to take into account about ten factors, and in a comprehensive assessment of the condition of all damaged objects (diseases, pests, weeds), their number will be much larger.

Modern advances in information technology (Big Data technologies) make it possible to quickly analyse any volume of information. Today, many countries have developed and are using a variety of decision support systems to manage the protection of agricultural crops, including cereals, from harmful organisms. For example, in Germany, the ProPLANTExpert system has been developed for managing crop protection and operates on the basis of the Internet. It uses information obtained from automatic weather stations. In addition, the user enters into the system the phase of plant development, the intensity of the disease, as well as a list of fungicides and growth regulators (if possible). The user receives recommendations on which preparation to process and in what time frame.

A DESSAC system has been set up in England to support decision-making to protect crops from disease. The system is installed on the user's computer. At program start-up, system users automatically receive meteorological information (current and prior period) from nearby meteorological stations, enter agroecological data, the degree of disease development and spread, and the cost of the fungicide. The program uses mathematical models that mimic the appearance and development of a plant, the development of the disease, the potential loss of a crop because of the disease, and the effectiveness of various fungicides. Control components such as variety selection, date of treatment, fungicides and consumption rates are recommended [8]. In the Netherlands, Dacom company has developed PLANT-Plus. The model used by the system takes into account information on plant status, disease development, preliminary and prognostic weather conditions (local). It advises when and how to treat fungicides [9].

In the United States, MoreCrop system operates to manage protection of wheat and barley against disease in the Northwest Pacific. It is designed for thirty plant diseases that are spread throughout the United States and in individual regions. Factors that influence the development and harmfulness of the disease, the effectiveness of protective measures and their economic feasibility are taken into account for decision making. In total, 11 factors are analysed [10].

In Denmark, the Landbrugsinfo system has been developed and maintained to help farmers make operational decisions (using the Internet) to grow field crops, considering agro-meteorological and phytosanitary situations. In addition to phytosanitary recommendations for protection against diseases and pests, it provides advice on fertilisers, irrigation and other methods of plant growing [11].

However, many of the systems currently in use are commercial. Users acquire or pay for software on their computers on the Internet. For Ukraine, the use of decision support systems for the protection of, for example, cereals based on phytosanitary expertise is particularly significant. Phytosanitary security of any state means the protection of its territory from the risks that arise in the event of the penetration, spread and mass reproduction of pests, diseases of plants and weeds. The latter poses a real danger and can cause significant economic losses in a very short time. It is known that, as a result of pest activity, national agricultural producers lose more than 30% of their gross harvest annually [12].

CONCLUSIONS

Developing national and applying international standards, as a key factor in creating a quality system in the field of plant quarantine, not only ensure full fulfilment by Ukraine of its obligations under the IPPC and SPS, agreeing on the phytosanitary safety of exported quarantine cargoes, but also increase the competitiveness of the domestic vegetal products in the world market. This creates a positive image of Ukraine as a reliable trading partner that does not violate the requirements of other countries and guarantees the conformity of product quality, phytosanitary procedures to internationally recognised standards. Therefore, for qualified phytosanitary examinations, the mechanism of guaranteeing compliance with national and international standards, amending legislation, introducing effective penalties for violation of the rules and procedure for conducting phytosanitary examinations should be a promising area.

1. ISPM No. 1. Phytosanitary Principles of Quarantine and Plant Protection and Application of Phytosanitary Measures in International Trade. (2006). Retrieved from https://gudpss-zp.gov.ua/post/16/1.pdf.

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