



**LAW ON STATE MANAGEMENT FOR
THE USE OF CHEMICALS IN PLANTING IN VIETNAM
AND SOME RELATED RECOMMENDATIONS**

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Abstract

Sustainably developing Vietnam's agricultural economy and expanding the agricultural product market to the world is an appropriate long-term direction for the Vietnamese economy. Therefore, it becomes even more critical that countries worldwide are increasingly focusing on environmentally friendly agricultural production, concentrating on organic agriculture, and increasingly limiting the use of chemicals in agriculture. To do this, one of the core factors is that the Vietnamese state must be the leading actor in operating the agricultural economy toward sustainable development. In the field of horticultural production, one of the primary responsibilities of the state to realize and achieve this goal is to focus on enhancing the responsibility of state management over the use of fertilizers and pesticides in cultivation. The article analyzes and points out inadequacies in Vietnamese law on state management of the use of chemicals in cultivation and practical issues of state responsibility in this field. The author completes this article by using documentation data collection, law analysis, and the comparison method. The ultimate goal of this article is to show the actual cases and the provisions of Vietnamese law on state management of chemical use in cultivation, in which analyzing inappropriate points leading to low efficiency of state management, then producing crop products under quality standards, not ensuring safety for human health, affecting the environment and failing to promote the strength of Vietnam's agriculture in the international market. To solve these inadequacies, this article offers different solutions to improve the provisions of national laws, thereby effectively promoting the state's management responsibility for using chemicals in cultivation in Vietnam. It is essential to

ensure that Vietnam's cultivated agricultural products exist in domestic and international markets, meeting food safety standards towards organic agriculture and sustainable development.

Keywords: chemicals, cultivation, fertilizer, plant protection products, state management, sustainable development

Introduction

The agricultural economy is an important economic sector. It has almost become a trademark of Vietnam in the world market with famous agricultural products such as rice, cashew, coffee, pepper, vegetables, fruits, and seafood. In recent years, with the application of scientific and technical achievements in agriculture, Vietnamese agricultural products are increasingly high quality, reasonably priced, nutritious, and accessible to many countries and regions. It makes Vietnamese agricultural products enjoy many preferential policies when importing. Specifically, before the European Union–Vietnam Free Trade Agreement – EVFTA¹, Vietnamese rice exports to the EU were subject to a very high tax rate of 4-5%. However, since the EVFTA was enacted, Vietnamese rice with a quota of 80,000 tons has been exempt from tax at 0%². As of October 2022, Vietnam's exports to the EU are mainly fruit, reaching USD 19.1 million, accounting for 90.8% of the total export value of vegetables and fruits to the EU. Of these items, the highest exports are passion fruit, lemon, and mango...³. The documents signed between Vietnam and other countries in the field of trade in agricultural commodities are creating more and more opportunities for Vietnam to expand the market to the world, thereby bringing many economic benefits for Vietnam and its farmers. However, besides the priority policies of green and organic agriculture, significant markets worldwide, such as the US and EU, are increasingly challenging to import agricultural products. Accordingly, to export agricultural products to large and fastidious markets like the EU, Vietnam's agricultural products must meet high-quality requirements and ensure consumer health safety. It is reflected in the fact that pesticide residues in Vietnamese fruits and vegetables must not exceed the maximum pesticide residue levels prescribed by importing countries. According to this regulation, vegetables and fruits imported into EU countries are increasingly subject to strict control. In early 2023, the EU officially issued

¹ EVFTA Agreement and related information <https://trungtamwto.vn/fta/199-viet-nam--eu-evfta/1>

² Take advantage of opportunities and space from the EVFTA Agreement, 2023, <https://kinhte.congthuong.vn/tan-dung-co-hoi-va-du-dia-tu-evfta-240476.html>

³ 10 months of 2022, the export of vegetables to the EU market increased by 20.2%, Nguyen Hanh, 2022, <https://congthuong.vn/10-thang-nam-2022-xuat-khau-rau-qua-sang-thi-truong-eu-tang-202-231737.html>

Regulation 2023/174, amending Regulation 2019/1793 on temporarily applying official and emergency control measures for certain goods imported into the EU. For example, in importing agricultural products for growing fruit, Vietnamese dragon fruit will be subject to the inspection frequency of plant protection drugs of 20%; okra and bell peppers of the Capsicum variety maintained a 50% frequency of inspection⁴. In parallel with the European Green Deal⁵, *the farm-to-fork strategy*, which sets a vital target of reducing toxic chemical pesticides by 50% by 2030⁶ has had a tangible impact on countries with agricultural products imported into the EU, including Vietnam. Meanwhile, in recent years, Vietnamese agricultural products entering the EU market have been repeatedly warned or returned⁷ due to a lack of food safety and residues of pesticides exceeding the permitted level or using banned substances in the cultivation of agricultural products.

For the domestic market, Vietnamese agricultural products are often warned about the arbitrary use of fertilizers and pesticides, including wastes, banned substances, and fake fertilizers to grow agricultural products. It will undoubtedly cause immediate or long-term harm to consumers' health and affect the ecological environment. Unfortunately, this situation still happens daily in Vietnam⁸ but there seems to be no radical solution to handle these violations.

It can be seen that there are many reasons why Vietnamese vegetables and fruits contain residues of pesticides and chemicals of unknown origin. However, one of the most important reasons is the need for more state management of the use of chemicals in cultivation. Currently, the provisions of Vietnamese law on state management of using fertilizers and pesticides are numerous. They are issued and guided by many relevant agencies and agencies subject to many laws. They are issued and guided by many relevant agencies and agencies subject to many laws. Four laws have significant impacts on the state's responsibility in this field, including the 2007 *Chemicals Law*, amended and supplemented in 2018 (hereinafter referred to as the *Chemicals Law*), the 2013 *Plant Protection and Quarantine Law*, amended and supplemented in 2018 (hereinafter referred to as the *Plant Protection and Quarantine Law*), the 2018 *Cultivation Law*

⁴ How has the import policy of the EU market changed? Bao Ngoc, 2023, <https://congthuong.vn/chinh-sach-nhap-khau-hang-hoa-cua-thi-truong-eu-thay-doi-ra-sao-240885.html>

⁵ A European Green Deal - Striving to be the first climate-neutral continent
https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en

⁶ Farm to Fork Strategy – For a Fair, Healthy, Environmentally – Friendly Food System, European Commission
https://food.ec.europa.eu/system/files/2020-05/f2f_action-plan_2020_strategy-info_en.pdf

⁷ Warning about bitter melon leaves and some agricultural products exceeding residues and banned substances, 2022,
<https://nongnghiep.vn/canh-bao-la-muop-dang-va-mot-so-nong-san-vuot-du-luong-va-chat-cam-d327549.html>

⁸ See also Section 2.2. in this article.

(hereinafter referred to as the Cultivation Law) and the 2010 *Food Safety Law*, amended and supplemented in 2018 (hereinafter referred to as the Food Safety Law). Although these laws complement each other in forming regulations on state management of using chemicals in cultivation, in many cases, they are intertwined, overlapping each other, causing inadequacies and shortages. It makes state management in this area ineffective.

To ensure horticultural agriculture with sanitary and safe products for human health and protect the ecological environment towards sustainable development, this article focuses on the Vietnamese state's management responsibility for using chemicals in cultivation. First, this article studies the legal provisions on state management of using chemicals in cultivation to achieve this goal in the abovementioned four laws and related legal documents. In addition, it also studies the actual situation of how farmers use chemicals in cultivation. Based on these studies, the author introduces an overview of the Vietnamese law provisions on state management of the use of chemicals in cultivation (section 1) and some issues on chemical use in horticulture regarding legislation, policy and practice on using chemicals in horticulture (section 2). From there, the author gives recommendations that Vietnamese law needs to implement to better play the role of state management over the use of chemicals in cultivation (section 3).

The article introduces the main provisions of Vietnamese law related to state management in using chemicals in cultivating and presents practical events related to fruit and vegetable production in Vietnam by using primary research methods, such as documentation data collection, law analysis, and comparison. This article has two primary purposes. One is to point out the inadequacies in the state management of using chemicals in cultivation according to the provisions of Vietnamese law, and the other is to give suggestions for the law of Vietnam to perfect the law on state management in this field. When these proposals are researched and implemented, the author hopes to create a synchronous and effective state management of using chemicals in cultivation, thereby creating clean and safe agricultural products for human health and environmental protection for the sustainable development of Vietnam's agricultural economy.

1. Overview of Vietnamese legislation on state management of chemical use in cultivation

Regulations on state management in using chemicals in cultivation are regulated in Vietnamese law, mainly in the Chemicals Law, the Plant Protection and Quarantine Law, the Cultivation Law and the Food Safety Law and documents guiding the implementation of these laws.

1.1. The main branches of law directly related to the state management of using chemicals in cultivation

The introductory provisions of Vietnamese law on state management of using chemicals in general and chemicals in cultivation in particular in the laws mentioned above are presented with the primary contents in the following Laws:

a) State management over the use of chemicals in cultivation following the provisions of the Chemicals Law

The Chemicals Law was promulgated in 2007 and took effect from July 1, 2008⁹, including 10 Chapters with 71 Articles, in which the contents related to using chemicals in cultivation are specified in the chapter on *General provisions of the Chemicals Law (Chapter 1)*; *Chemical industry development (Chapter 2)*; *Use of chemicals (Chapter 5)*; *Environmental protection and community safety (Chapter 8)*; *State management responsibility for chemical activities (Chapter 9)*. The provisions of this Chemicals Law prescribe the most general contents of state management responsibilities of the Government, ministries and ministerial-level agencies, and of People's Committees at all levels in the state management of chemical activities (including contents related to the use of chemicals in cultivation) whose primary responsibility lies with the Ministry of Industry and Trade.

The Chemicals Law mentioned above regulates the contents of chemical activities in Vietnam. It means that many chemical activities in Vietnam are covered by this law¹⁰, including chemical activities in the fields of industry, health, agriculture, research, etc.; production, trading, transportation, use and treatment of chemicals; the rights, obligations and responsibilities of agencies, organizations and individuals in chemical activities, etc. However, for the state management of chemical activities in agriculture in general and in cultivation in particular, the Chemicals Law do not have separate regulations that are reflected in many different provisions in the Chemicals Law, such as regulations on *Prohibited acts in chemical activities (Article 7)*; *Chemical production and trading (Chapter 3, Articles 11 to 26)* regulates the production and trading of chemicals in general, including regulations related to production and trading activities of chemical used in cultivation such as fertilizers, plant protection products, etc.; chemicals banned or restricted from use in agriculture and cultivation, residual chemical transportation,

⁹ See Vietnam Chemicals Law

¹⁰ Clause 7, Article 4 of Vietnam Chemicals Law stipulates “7. *The chemical activity involves investing, producing, bottling, packing, trading, exporting, importing, storing, preserving, using, researching, testing chemicals and treating chemicals waste*”.

treatment and disposal; and substances chemical waste and containers, etc.; *Use of chemicals (Chapter 5)*... For these regulations to be detailed and suitable for each field of chemical activities, legal documents were issued guiding the implementation of the Chemicals Law, which directly related to many contents of state management over chemical activities in cultivation. However, no separate document exists for state management of chemical activities in agriculture in general and cultivation in particular.

To ensure the responsibility assigned by the state in the management of chemical activities, on January 2, 2009, the Prime Minister signed Decision No. 01/QD-TTg to establish Vietnam Chemicals Agency, abbreviated as VINACHEMIA. This agency advises and assists the Minister of Industry and Trade in state management and law enforcement organization for chemical activities. However, although it was established in 2009, it was only on October 3, 2017, that the Minister of Industry and Trade issued Decision No. 3828/QĐ-BCT on functions, tasks, powers and organizational structure of the Vietnam Chemicals Agency¹¹. Thus, the Vietnam Chemicals Agency is almost impossible to operate until 2017 due to no legal framework, although it was established in 2009. Therefore, it leads to a series of inadequacies in state management of chemical activities in general and chemical activities in animal husbandry and cultivation particularly during a long time from 2017 and earlier in Vietnam.

b) State management over the use of chemicals in cultivation in the provisions of the Plant Protection and Quarantine Law

This Law was promulgated on November 25, 2013, and amended and supplemented in 2018, including 5 Chapters with 77 Articles. This law presents regulations related to state management of chemical use in cultivation in Chapters on *General Regulations (Chapter 1)*; *Management of plant protection products (Chapter 4)*. In particular, the contents directly related to the use of chemicals in cultivation are concentrated in Chapter 4 on *Management of plant protection products*. This Chapter prescribes *plant protection products management and registration (Section 1)*; *Plant protection products testing (Section 2)*; *Producing, trading, importing, exporting, transporting, preserving, advertising, packaging, labelling and using plant protection products (Section 3)*; *Recalling, destroying, collecting and treating plant protection products packaging after use (Section 4)*. Among these contents, the use of chemicals in cultivation is concentrated in Section 3, Article 72, on the rights and obligations of

¹¹ Regulations on functions, tasks, powers and organizational structure of Department of Chemicals <http://cuchoachat.gov.vn/van-ban-phap-quy/quy-dinh-chuc-nang-nhiem-vu-quyen-han-va-co-cau-to-chuc-cua-cuc-hoa-chat.html>

organizations and individuals using plant protection products. This regulation entails the state's responsibility in managing the implementation and observance of the rights and obligations of users of plant protection products during the cultivation process. In addition, the responsibility for state management in the use of chemicals in cultivation to ensure human health and the environment is also reflected in above Section 4.

However, since this Law aims to regulate activities related to plant protection and quarantine, the regulations on the use of chemicals in this Law aim to prevent plant diseases, not the management of chemical use in cultivation. Accordingly, the state management of the use of chemicals in cultivation in this Law does not cover the fields where chemicals are used.

c) State management over the use of chemicals in cultivation in the provisions of the Cultivation Law

The Cultivation Law was promulgated on November 19, 2018, including 7 Chapters with 20 Sections and 85 Articles. The provisions of the Cultivation Law that regulate farming activities in general related to the use of chemicals include *General Regulations (Chapter 1)*; *Fertilizers (Chapter 3)*; *Farming (Chapter 4)*; *Harvest, preliminary processing, preservation, processing, trade and quality control of crop products (Chapter 5)* and *State management of cultivation activities (Chapter 6)*. In this law, the content of state management of cultivation activities is regulated in Chapter 6 and Articles 82 and 83, in which, Article 82 regulates the responsibilities of the Government, Ministries and ministerial-level agencies, especially the Ministry of Agriculture and Rural Development, in the state management of cultivation on a national scale; Article 83 stipulates the responsibilities of People's Committees at all levels in the management of cultivation in their respective localities. Therefore, although the Cultivation Law is not the Chemicals Law, the contents related to the use of chemicals and state management of using chemicals in cultivation are very much regulated in the Cultivation Law. For example, the provisions in Chapter 3 on *Fertilizers* include the Sections *Recognition of fertilizers in circulation and testing of fertilizers (Section 1)*; *Fertilizer production and trading (Section 2)*; *Export and import of fertilizers (Section 3)*; *Quality, names, labels, advertising management of fertilizers (Section 4)*; and *Rights and obligations of organizations and individuals operating in the field of fertilizers (Section 5)*. Regulations on chemicals and chemical management in cultivation are also mentioned in Chapter 4 on *Farming*, in sections such as *Use of agricultural equipment and supplies (Section 2)* and *Organic farming (Section 5)*. Through studying these regulations, it can be seen that, in the Cultivation Law, the regulations on chemicals and state management

of chemicals in cultivation, although more detailed in the Chemicals Law, only focus on chemicals that are fertilizers without proper regulations on plant protection products (herbicides, pesticides, etc.).

d) State management over the use of chemicals in cultivation in the provisions of the Food Safety Law

This Law was promulgated on June 17, 2010, and amended and supplemented in 2018, including 11 Chapters with 72 Articles. It is a law on ensuring food safety, so activities related to food production are strictly regulated by this law to ensure that food is hygienic and safe from the production stage. Therefore, the activities of growing crops to harvest agricultural products for food are regulated in detail by this law to ensure that agricultural products, in general, and cultivation, in particular, are clean and safe for users. Accordingly, the Food Safety Law provisions stipulate many contents related to the production of safe agricultural products. These regulations have a direct impact on the use of chemicals in cultivation, as shown in the Chapters on *General Regulations (Chapter 1)*; *Rights and obligations of organizations and individuals in ensuring food safety (Chapter 2)*; *Conditions for ensuring food safety (Chapter 3)*; *Conditions for ensuring food safety in food production and trading (Chapter 4)*; *Certification of establishments meeting food safety conditions in food production and trading (Chapter 5)*. In parallel, the contents of state management of clean and safe food production are specified in *Chapter 10 on State management of food safety*.

In addition to the above four fundamental laws directly related to the state management of chemical activities in cultivation, there are also other Laws with regulations related to the use of chemicals in cultivation, such as the 2020 Environmental Protection Law, amended and supplemented in 2022, the 2022 Inspection Law, etc. These laws also contain provisions related to food production as cultivated agricultural products and require that the cultivation satisfy the conditions on food safety. Therefore, these laws all contain provisions on state management for using chemicals.

In general, the regulations on state management of using chemicals in cultivation in Vietnam are regulated in many different laws, in which, the content of the principles of these laws are ultimately aimed at *ensuring safety for people, ecosystems and the environment, and ensuring that the State strictly controls chemical activities, information on chemicals in general and chemicals in cultivation in particular always to be transparent, complete, accurate and timely about hazardous properties of chemicals as*

prescribed in the Chemicals Law¹². Accordingly, these laws all define the general responsibilities of the government, specific responsibilities of ministries and ministerial-level agencies, and People's Committees at all levels in the state management of chemical use in agriculture in general and in cultivation in particular¹³.

1.2. Basic regulations on state management over the use of chemicals in cultivation in Vietnam

State management overusing fertilizers and plant protection products include many micro and macro contents. Within the scope of this article, the author focuses on the four most explicit contents of state management in this field, (1) the principle of using chemicals in cultivation, (2) the entities that may be responsible for the state management of chemicals in cultivation, (3) the activities of using chemicals in cultivation.

a) The principle of using chemicals in cultivation

The principles of using chemicals in agriculture in general and cultivation, in particular, are not regulated as separate principles in any law. However, through the primary laws that directly regulate chemicals in agriculture as above, it can be seen that the principles of using chemicals in cultivation include the following main principles:

+ First, to ensure safety for humans, the environment and the ecosystem (clause 1, Article 5 of the Chemicals Law; clause 3, Article 3 of the Cultivation Law; clauses 1 and 2, Article 3 of the Food Safety Law). This principle is geared towards the protection of human health and sustainable development.

+ Second, to strictly control chemical activities related to cultivation, including chemicals used in growing plant species for food. Accordingly, cultivation activities will use chemicals such as fertilizers and plant protection products (clause 2, Article 5 of the Chemicals Law; clauses 2 and 3, Article 3 of the Cultivation Law; clause 2, Article 7 of the Food Safety Law).

+ Third, to ensure adequate information on chemicals in cultivation, including information on chemicals used for food production; promptly and adequately warn of

¹² See Article 5 of the Chemicals Law; Chapter 3 regulates *Fertilizers* in the Cultivation Law; Chapter 4 of Plant Protection and Quarantine Law. In addition, the provisions on *Prohibited Acts* in these laws also represent the principle of chemical use in general and chemical use in cultivation in particular, specifying that all production and farming businesses activities must ensure the safety of humans, the ecosystem and the environment (Article 7 of the Chemicals Law, Article 9 of the Cultivation Law, Article 5 of the Food Safety Law, etc.)

¹³ See Chapter 9 of the Chemicals Law; Chapter 6 of the Cultivation Law; Chapter 4 of Plant Protection and Quarantine Law; Chapter 10 of the Food Safety Law. In addition to the Chapters of these Laws, many other provisions in these and other laws related to the state management of the use of chemicals in cultivation.

risks when using chemicals in producing food and report to the competent authority when detecting chemical incidents in crop products (clause 3, Article 5 of the Chemicals Law; point c, clause 2, Article 72 of the Food Protection and Quarantine Law; clause 2, Article 7 of the Food Safety Law). This principle ensures that the use of chemicals in cultivation must be safe for users and the community.

+ Fourth, the use of chemicals in cultivation, especially the use of plant protection products, must comply with the four-correct principles, including correct drug, correct period, correct dose and concentration, and correct method, to comply with the quarantine period (clause 3, Article 4 of the Plant Protection and Quarantine Law). This principle is to ensure that products grown for food are clean and safe for consumers' health.

+ Fifth, to meet the requirements of international integration; comply with international treaties to which the Socialist Republic of Vietnam is a contracting party (clause 6, Article 3 of the Cultivation Law; point 1, clause 2, Article 7 of the Plant Protection and Quarantine Law; clause 3, Article 38, clauses 2 and 3, Article 39, and clause 2, Article 41 of the Food Safety Law)¹⁴. This principle is intended to ensure that Vietnam's agricultural crop production can supply high-quality products to the world market and ensure environmental protection with other countries for sustainable development.

Although the above principles are prescribed in many different laws, they all aim to regulate how chemicals in cultivation are used to ensure human safety and the sustainable development of domestic agriculture towards exporting according to international standards, protecting the environment and the ecosystem. From these principles, regulations on state management in cultivation are also regulated accordingly.

b) Entities responsible for state management in the use of chemicals in cultivation

¹⁴ In the field of cultivation, in addition to Vietnamese legal documents, Vietnam has also signed many international legal documents, such as the Stockholm Convention on Persistent Organic Pollutants, to control and limit the use of persistent organic pollutants (POPs); the Rotterdam Convention on the Prior Informed Consent Procedure is intended to govern the transfer of prohibited or restricted substances in horticulture through prior notice and consent of the related parties; The Chemical Safety Convention (CSC) aims to promote safety in the management of chemicals, including restrictions on the use of potentially harmful chemical compounds in cultivation or documents such as the Convention on Biological Diversity (CBD); the United Nations Framework Convention on Climate Change (UNFCCC); the Agreement on Agriculture (AoA), etc. These international documents are of great value in shaping Vietnam's agricultural practices towards the common goal of ensuring the production and export of quality agricultural products safe for health and protecting the natural environment towards sustainable development. Although these documents significantly impact cultivation activities in Vietnam and do not interfere profoundly with the state management of cultivation in signatory countries, they are essential orientations for establishing regulations on state management of cultivation activities in Vietnam.

To perform the state management of cultivation, Vietnamese law stipulates that the following entities are responsible for conducting the below activities:

- *Government*: The Government is the agency acting on behalf of the state performing the function of state management of chemical activities in all fields. Depending on specific fields of chemical activities, the Government decentralizes Ministries and ministerial-level agencies to perform the state management of each chemical field.

- *Ministry of Industry and Trade*: Although the Ministry of Industry and Trade is not the agency with the primary and direct responsibility for the use of chemicals in cultivation, the Ministry of Industry and Trade is the agency responsible for the management of chemical activities in general throughout the territory of Vietnam. The primary responsibility of the Ministry of Industry and Trade regarding chemicals in cultivation is the responsibility of managing the chemical industry in the field of fertilizer production¹⁵.

- *Ministry of Agriculture and Rural Development*: In the field of chemical use in cultivation, the Ministry of Agriculture and Rural Development is the central professional management agency responsible for *the management of chemicals used in cultivation and plant protection; coordinating with the Ministry of Industry and Trade and relevant ministries and branches in formulating the List of banned chemicals and the List of chemicals restricted from production and trading; promulgating the List of chemicals banned, restricted from use and permitted to use in the agricultural sector; guiding to classification, labelling and formulation for chemical safety sheets for plant protection products*¹⁶. Based on these provisions of the Chemicals Law, other laws, including the Cultivation Law, the Plant Protection and Quarantine Law and the Food Safety Law, specify the state management responsibilities of the Ministry of Agriculture and Rural Development in the management of chemical use in general and in cultivation in particular, and in quality management of cultivated agricultural products¹⁷. Accordingly, the Ministry of Agriculture and Rural Development is responsible for itself or in collaboration with other ministries and ministerial-level agencies in formulating laws, schemes and strategies in agriculture in general and in cultivation in particular; promulgating standards, technical regulations and production processes in cultivation,

¹⁵ Clause 1, Article 63 of the Chemicals Law; clauses 2 and 3, Article 64 of the Food Safety Law

¹⁶ Clause 5, Article 64 of the Chemicals Law.

¹⁷ Article 63 of the Food Safety Law

which are closely related to the use of chemicals in cultivation; organizing the implementation of activities related to permits in cultivation, including permits related to fertilizers¹⁸, plant protection products¹⁹ and other activities related to plant protection products²⁰; building a national database related to agriculture in general and cultivation in particular; conducting activities of research, science and technology application, essential investigation, international cooperation, professional training, inspection and test in cultivation and using chemicals in cultivation on a national scale.

- *People's Committees at all levels*: People's Committees at all levels are responsible for managing the use of chemicals in cultivation in the areas under their management; ensuring compliance with regulations, technical standards and processes set out by the Ministry of Agriculture and Rural Development and Ministry of Industry and Trade; performing specific tasks on state management over the use of chemicals in cultivation in the locality according to the government's decentralization; conducting inspection, examination, settlement of complaints and denunciations, and imposing penalties for administrative violations related to chemical activities in cultivation in the locality according to the Government's decentralization²¹.

The provisions of the Chemicals Law and other laws directly related to the use of chemicals in cultivation have a specific decentralization of state management responsibilities for the use of chemicals in cultivation from central to local levels based on coordination of ministries and agencies related to chemical activities in general. This regulation of state management entities for the use of chemicals in cultivation has formed a closely linked network to utilize the coordination power of all levels and sectors involved in the management of the use of chemicals in cultivation, thereby ensuring that the use of chemicals in cultivation is always well controlled and creates clean and safe agricultural products for human health and protection of the ecosystem, which is an essential basis for building sustainable agriculture.

c) Entities of state management in the use of chemicals in cultivation

Up to now, there is no provision in the laws to identify or list specific groups of entities subject to the impact of state management on the use of chemicals in cultivation.

¹⁸ Article 41 of the Cultivation Law; Articles 13 and 17 of Decree No. 84/2019/ND-CP, dated November 14, 2019, of the Government, promulgating Regulations of fertilizer management.

¹⁹ Decree No. 123/2018/ND-CP, dated September 17, 2018, of the Government, amending and supplementing some Decrees regulating investment and business conditions in the field of agriculture.

²⁰ Point dd, clause 2, Article 7 of Plant Protection and Quarantine Law.

²¹ Article 65 of the Chemicals Law, Article 83 of the Cultivation Law, Article 65 of the Food Safety Law, Article 8 of the Plant Protection and Quarantine Law.

However, it can be understood that any individual or organization engaged in cultivating vegetables, fruits, and foodstuffs is subject to the influence of state management on the use of chemicals in cultivation. Thus, considering the concept of cultivation activities broadly, the entities subject to state management over the use of chemicals in cultivation include organizations and individuals that directly carry out the cultivation to produce food and foodstuffs and organizations and individuals that preserve and transport crop products. On the other hand, considering the concept of cultivation activities narrowly, the entities subject to state management over the use of chemicals in cultivation are only organizations and individuals that carry out the cultivation for food production. In this article, the author narrowly considers the concept of cultivation activities, that is, only studies using chemicals in cultivation for food production. Accordingly, the entities subject to state management in specific cultivation include:

- *First, individuals or households* cultivate vegetables, fruits and food crops (rice, sticky rice, corn, etc.) to get products for food and foodstuffs. This group again includes two types: (1) individuals and households who, after harvesting, will carry out their own business and retail trade in their products or resell them to individuals or intermediary organizations for these individuals to conduct business in agricultural products; (2) individuals and households that grow vegetables, fruits, and food crops to serve their own food use needs, not for business purposes, often referred to as "self-sufficiency";

- *Second, organizations* cultivate crops to harvest products for the food business. These are professional organizations such as farms²², cooperative groups, cooperatives²³ or businesses²⁴.

²² By the end of 2021, the whole country will have 4,325 cultivation farms; (Farm economic development contributes to efficient use of land, 2022, <https://nhandan.vn/phat-trien-kinh-te-trang-trai-gop-phan-su-dung-hieu-qua-dat-dai-post692797.html>). Farms generally operate following Circular No. 02/2020/TT-BNNPTNT of the Ministry of Agriculture and Rural Development, dated February 28, 2020, on Regulations on-farm economic criteria.

²³ As of December 31, 2019, the country had 7,418 agricultural, forestry and fishery cooperatives, an increase of 6.80% compared to 2015. Of these, 6,885 agricultural cooperatives account for 92.81% of the total number of agricultural, forestry and fishery cooperatives, an increase of 3.60% compared to 2015. (Press release on the results of the midterm rural and agricultural survey in 2020; <https://www.gso.gov.vn/du-lieu-va-so-lieu-thong-ke/2021/06/thong-cao-bao-chi-ve-ket-qua-dieu-tra-nong-thon-nong-nghiep-giua-ky-nam-2020/>). In Vietnam, cooperatives operate under the Cooperative Regulation, in which cultivation cooperatives organize and operate according to Circular No. 09/2017/TT-BNNPTNT of the Ministry of Agriculture and Rural Development, dated April 17, 2017, on Guidelines for classification and assessment of cooperatives operating in the agricultural sector.

²⁴ As of December 31, 2019, the whole country had 7,471 enterprises in agriculture, forestry and fishery, an increase of 94.25% compared to December 31, 2015, an average annual increase of 906.3 enterprises (Press release on the results of the midterm rural and agricultural survey in 2020; <https://www.gso.gov.vn/du-lieu-va-so-lieu-thong-ke/2021/06/thong-cao-bao-chi-ve-ket-qua-dieu-tra-nong-thon-nong-nghiep-giua-ky-nam-2020/>). In Vietnam, businesses organize and operate under the 2020 Enterprise Law, amended and supplemented in 2022.

Thus, the state management of the use of chemicals in cultivation in the narrow sense will affect the use of chemicals by individuals, households, farms, cooperatives, and businesses directly implementing the cultivation of vegetables, fruits and foodstuffs for food production.

d) Activities using chemicals in cultivation are subject to state management

Farming and crop-related activities in agriculture include production, preservation, transportation, trade, and import and export of agricultural products, in which, the use of chemicals in cultivation activities is carried out mainly during the production (the process of growing agricultural products for products) and preservation stage of agricultural products. In the cultivation of agricultural products, the state management over the use of chemicals is carried out in the following contents:

- *First, to manage fertilizers and plant protection products used in growing agricultural products.* This management is carried out by investigating the domestic market and controlling the import activities of fertilizers and plant protection products through inspection activities of the actual cultivation for individuals and organizations engaged in cultivation activities²⁵. Currently, the list of fertilizers and plant protection products permitted to use and restricted and banned from use is regularly updated by the authorities to keep up with the development of chemicals in cultivation available on the market²⁶.

- *Second, to manage the period to use fertilizers and plant protection products and the isolation period after using these chemicals in cultivation; manage the dosage and concentration of fertilizers, plant protection products, and how to use these chemicals.* The content of this management comes from the principles for the use of chemicals in cultivation specified in clause 3, Article 4 of the Plant Protection and Quarantine Law, as mentioned above. This management is ensured by specialized ministerial-level agencies, mainly the Ministry of Agriculture and Rural Development and local governments,

²⁵ Point dd, clause 2, Article 7 of Plant Protection and Quarantine Law; Articles 25 and 26 of Decree No. 84/2019/ND-CP.

²⁶ Article 3 of Decree No. 84/2019/ND-CP of the Government, dated November 14, 2019, Regulations on fertilizer management and Decree No. 130/ND-CP of the Government, dated December 31, 2022, on amendments and supplements some articles of Decree No. 84/2019/ND-CP of the Government, dated November 14, 2019, Regulations on Fertilizer Management and Decree No. 94/2019/ND-CP of the Government, dated December 13, 2019, Detailed regulations on several articles of the Cultivation Law on plant varieties and cultivation; Circular No. 19/2022/TT-BNNPTNT of the Ministry of Agriculture and Rural Development, dated December 2, 2022, promulgating the List of plant protection products permitted to use in Vietnam and the List of plant protection products banned from use in Vietnam (<https://thuvienphapluat.vn/van-ban/Linh-vuc-khac/Thong-tu-19-2022-TT-BNNPTNT-Danh-muc-thuoc-bao-ve-thuc-vat-duoc-phep-su-dung-tai-Viet-Nam-543292.aspx>)

namely the People's Committees at all levels. In particular, the agency with the most direct and timely responsibility is the People's Committee of communes, wards and townships (collectively referred to as the People's Committees of communes), which coordinates with specialized agencies to protect and quarantine the plants in the area of investigation; supervise and guide people to use plant protection products safely and effectively; inspect and manage the use of plant protection products in the locality²⁷. This management content is also ensured through training, guidance, propaganda and education on these techniques for users of these chemicals²⁸.

- *Third, to manage the disposal of residual chemicals, chemical waste and containers for cultivation.* The use of chemicals in general and chemical used in cultivation in particular, in some respects, have specific impacts on the environment and ecosystems. Therefore, an important content of state management for using chemicals in cultivation is the management of discarded or residual fertilizers, plant protection products, and their containers. If this management is not done well, it will have specific effects on human health and the environment. It can be easily seen in practice, such as releasing residual fertilizers or plant protection products into water, soil or air; or containers which are solid objects, such as packages, containers, etc., are arbitrarily discarded by the user in the cultivation area. Residual and disposed of chemicals, and these containers, if not collected and handled properly, can all negatively affect humans and the living environment, long-term or in large quantities, impacting ecosystems and sustainable development. The responsibility for the disposal of this chemical residue, waste, and containers of agrochemicals rests primarily with the user. Therefore, they must be responsible and receive appropriate instruction and training to handle this waste. However, the ultimate responsibility is still the state's, including the Government, the Ministry of Agriculture and Rural Development, the Ministry of Natural Resources and Environment, and the People's Committees at all levels, for chemical waste management in general and chemical waste management in cultivation in particular. They must be responsible for guiding, training, propagating and educating users of chemicals in

²⁷ Point c, clause 2, Article 8 of Plant Protection and Quarantine Law; Articles 25 and 26 of Decree No. 84/2019/ND-CP

²⁸ Training for users of fertilizers and plant protection products is the responsibility of the Ministry of Agriculture and Rural Development, People's Committees at all levels and specialized agencies in plant protection (clause 3, Article 5, point c, clause 2, Article 6, point e, clause 2, Article 7, point d, clause 1, Article 8, Article 10, clause 5, Article 16 of Plant Protection and Quarantine Law; point d, clause 1, point c, clause 2, Article 83 of the Cultivation Law). In addition, fertilizer production facilities must also be responsible for training and guiding the use of fertilizers for users of their products (point g, clause 2, Article 50 of the Cultivation Law). This responsibility of fertilizer production facilities is also subject to state control and inspection to ensure that this responsibility of the establishment is carried out in practice.

cultivation, having the policy to collect solid waste as chemical containers used in cultivation²⁹.

- *Fourth, to manage prohibited acts.* Prohibited acts in the use of chemicals in general and in the use of chemicals in cultivation in particular are acts that, when performed, pose a risk of adverse impacts on human life and health and a negative impact on the environment. In order to ensure the safe use of chemicals in cultivation, in addition to the primary contents that chemical users must comply with, the law also stipulates prohibited acts. Accordingly, state management agencies must be responsible for inspecting and checking to ensure that these acts are not carried out during the cultivation of agricultural products. Prohibited acts when using chemicals in cultivation include: *Using plant protection products on the List of plant protection products banned from use in Vietnam; fake, unknown original or expired plant protection products; plant protection products that are not on the List of plant protection products permitted to use in Vietnam (except for the case specified in clause 2, Article 67 of the Plant Protection and Quarantine Law); Using dangerous chemicals in contravention of the Chemicals Law and other relevant laws, using chemicals not on the list of permitted use, chemicals not meeting standards and quality, exceeding the allowable amount for food production; Producing, trading, and importing fertilizers that have not been approved for circulation in Vietnam (except for the case of import of fertilizers specified in clause 2, Article 44 of the Cultivation Law, and production of fertilizers for export under contracts with foreign organizations and individuals); Using chemicals of unknown origin, chemicals banned from use in food production and trading*³⁰. If individuals or organizations that cultivate agricultural products commit violations, they shall, depending on the nature and severity, be handled according to the provisions of the law.

In general, the provisions of Vietnam's law on state management of the use of chemicals in cultivation are complete with principles in the use of chemicals in cultivation, with allocation and assignment of responsibilities between state agencies at all levels and specialized agencies in cultivation. The current provisions of the law also define the contents of state management to ensure that the use of chemicals in cultivation

²⁹ Currently, regulations on the collection and treatment of these solid wastes are specified in Section 4, Chapter 4 of Plant Protection and Quarantine Law guided in Joint Circular No. 05/2016/TTLT-BNNPTNT-BTNMT of Ministry of Agriculture and Rural Development and the Ministry of Natural Resources and Environment, dated May 16, 2016, guiding the collection, transportation and treatment of plant protection products packaging after use.

³⁰ See regulations specified in clauses 6 and 8, Article 13 of Plant Protection and Quarantine Law, clauses 1 and 3, Article 7 of the Chemicals Law, clause 2, Article 9 of the Cultivation Law and clause 3, Article 5 of the Food Safety Law.

is appropriate and within control, prohibiting arbitrary use of chemicals in cultivation. These regulations are the legal corridor for the competent authority to conduct training, propaganda, education and guide growers with the necessary knowledge and skills when using chemicals in cultivation. These are the first primary conditions for cultivation activities to meet safety standards for human health and protect the natural environment for sustainable agricultural development and ecosystem protection. These regulations are also the basis for determining state management responsibilities in the management and use of chemicals in cultivation and for formulating specific regulations on handling violations if state management agencies are irresponsibly managing and handling growers as their violations are severe enough to be sanctioned.

In addition to the above introductory provisions on state management of the use of chemicals in cultivation, other contents in the Chemicals Law, the Plant Protection and Quarantine Law, the Cultivation Law and the Food Safety Law and detailed guidance documents on the implementation of these laws also regulate many other contents related to the use of chemicals in cultivation. For example, contents such as state management responsibilities in the issuance and revocation of certificates in food production and export can be mentioned (Article 35 of the Food Safety Law); responsibilities of the state on granting, re-granting, extending and cancelling the Decision on recognition of fertilizers circulating in Vietnam (Articles 37 and 38 of the Cultivation Law); responsibility of the state in promulgating the List of plant protection products permitted for use in Vietnam and the List of plant protection products banned from use in Vietnam, on the management and registration of plant protection products, on the use of plant protection products (from Article 48 to Article 54 of the Plant Protection and Quarantine Law) and other provisions in the Chemicals Law. Together with the core regulations on state management for the use of chemicals in cultivation as analyzed above, these regulations constitute a system of regulations on state management of chemical use in cultivation towards ensuring the supply of clean, nutritious and safe agricultural products for human health and the environment.

2. Some issues about state management in the use of chemicals in cultivation in Vietnam

The state management of the use of chemicals in cultivation in Vietnam faces many shortcomings, most of which need to be improved in the provisions of laws and policies directly related to the state management of using fertilizers and plant protection

products. Besides, using fertilizers and plant protection products by growers is also challenging to manage chemical use in cultivation.

2.1. Regarding law and policy

In the provisions of Vietnamese law on state management of the use of chemicals in cultivation, the following shortcomings can be seen prominently:

- *Firstly, the need for more clarity in the legal provisions on state management's responsibility for using chemicals in cultivation.* Currently, in terms of state management, a clear fact in the provisions of the law is the overlap, interference or conflict of the authority of functional agencies in managing the use of fertilizers and plant protection products. It is detailed as follows:

+ *First, the ambiguity and need for more specificity about the state management authority over chemical activities in agriculture.* Currently, the Chemicals Law and other laws, such as the Plant Protection and Quarantine Law, the Cultivation Law and the Food Safety Law, need clear regulations on the use of chemicals in agriculture in general and in cultivation in particular. It comes from the fact that Vietnam does not have a Law on Agriculture. In contrast, the above laws only generalize chemicals or the use of chemicals in different fields, but not a separate law on agrochemicals. Although this is reasonable, it leads to the consequence that the use of chemicals in agriculture in general and chemical use in cultivation in particular has yet to be precisely regulated; thereby, these substances need to be clarified. It is a significant gap in food safety and environment, especially in the context that Vietnam is predominantly agricultural.

+ *Second, the need for more systems and interference in the state management regulations on using chemicals in cultivation.* Currently, the regulations on using chemicals in cultivation are scattered, intertwined and overlapped between the laws, making the state management regulations on using chemicals in cultivation very complicated. As analyzed in previous sections, the regulations on the use of chemicals in cultivation (including fertilizers and plant protection products) are currently regulated in many different laws, namely the Chemicals Law, the Plant Protection and Quarantine Law, the Cultivation Law and the Food Safety Law. Although these regulations are geared towards three core values, including (1) protecting consumers' health; (2) protecting plant varieties, and (3) protecting the environment, ecosystems and are all towards the goal of sustainable development, the regulations related to the use of chemicals in cultivation are dispersed in many laws, each law has a different system of

implementing documents, making these regulations intertwined and complicated. Moreover, in Vietnam, in addition to the laws, there are decrees, circulars, decisions, etc., to guide the implementation of the laws, so there are many more guiding documents for each law. Therefore, there are thousands of relevant documents on using chemicals in general and in cultivation in particular. It inevitably conflicts with the law enforcement guidelines for using chemicals in cultivation³¹. For example, the regulations on the collection and treatment of solid waste, that are the packaging of plant protection products after use, are also regulated in the Plant Protection and Quarantine Law, Chapter 4, Section 4, but at the same time, guided in the Joint Circular No. 05/2016/TTLT-BNNPTNT-BTNMT of the Ministry of Agriculture and Rural Development and the Ministry of Natural Resources and Environment. Thus, the collection and treatment of plant protection product packages after use is concurrently subject to the provisions of the Plant Protection and Quarantine Law and the state management of the Ministry of Agriculture and Rural Development, is again regulated by the Environmental Protection Law and under the management of the Ministry of Natural Resources and Environment³². It leads to an overlap in the state management of the use of chemicals in cultivation.

- *Secondly, the lack of a set of Technical standards and Regulations for the agricultural sector* leads to the ineffectiveness of state management in ensuring the use of fertilizers and plant protection products according to the "four-correct" principle. It is reflected in the following points:

+ *First, the standards and technical regulations for the agricultural sector still need to be improved*, such as regulations on the control of plant protection product residue. Currently, of the four laws directly related to the use of chemicals in cultivation, namely the Chemicals Law, the Plant Protection and Quarantine Law, the Cultivation Law and the Food Safety Law, the Cultivation Law is the primary law regulating cultivation activities, but the control of plant protection product residues in agricultural products belongs to the Ministry of Health³³, which makes it difficult to control the use of plant protection products as well as their residues focusing on the "post-control" stage,

³¹ In the field of law for which the Ministry of Agriculture and Rural Development is responsible and valid, there are only 553 valid documents from 2014-2018, of which documents related to cultivation are still valid and accounts for about 80% of the total number of these documents. <https://vbpl.vn/tw/pages/vbpq-hethonghoachitiet.aspx?ItemID=260&dvid=319>

³² Joint Circular No. 05/2016/TTLT-BNNPTNT-BTNMT of the Ministry of Agriculture and Rural Development and the Ministry of Natural Resources and Environment, dated May 16, 2016, guiding the collection, transportation and treatment of plant protection products packaging after use.

³³ Circular No. 50/2016/TT-BYT of the Ministry of Health, dated December 30, 2016, Regulation on the maximum limit of plant protection products residues in food.

that is, concentrating on controlling plant protection product residues on crop products. Although the control process focusing on “post-control” is reasonable because it focuses on ensuring product quality output, it is conceivable that during the growing process, it is challenging for the farmers to imagine future plant protection product residues in finished products. In addition, the current National Technical Regulations and Standards only stop at the procedures for determining plant protection product residues on certain crop products without standard procedures to develop maximum residue levels of plant protection products for crop products in general. Therefore, the state management for controlling plant protection product residues will not have specific scientific standards, quickly causing the arbitrariness of competent people in setting standards for maximum plant protection product residues on agricultural products. Moreover, the collection, transportation and treatment of plant protection product packaging after use, although guided by the Joint Circular No. 05/2016/TTLT-BNNPTNT-BTNMT has no strict Technical Regulation.

+ *Second, the regulations on technical regulations and standards for fertilizers, plant protection products and other related regulations and standards need to be updated and more suitable for the current context of the general development of the chemical industry in general and the development of the fertilizer and plant protection product sector in particular. Most of Vietnam's standards and technical regulations must be updated and developed. For example, when users need to search for information on the National Technical Regulation on plant protection product residues in the soil at the Standards Portal of the Vietnam Institute of Standards and Quality³⁴, the displayed Regulation is the 2008 version³⁵; similarly, when it is necessary to search for information on the National Technical Regulation on hazardous waste thresholds applicable to organizations and individuals generating waste, units collecting, transporting, storing, treating, destroying and burying waste, the Technical Regulation displayed on this website is the 2009 version³⁶. The need for updating, supplementing or using these outdated Regulations makes the practical application no longer suitable with the current context of chemical use in cultivation and makes compliance with the process inconsistent; there are many loopholes, but it is challenging to handle violations.*

³⁴ National standard data portal <https://tieuchuan.vsqi.gov.vn/>

³⁵ Look up the Regulation <https://tieuchuan.vsqi.gov.vn/tra-cuu-quy-chuan?k=&si=QCVN+15%3A2008%2FBTNMT&st=&tt=&df=&dt=&cq>

³⁶ National regulation <https://tieuchuan.vsqi.gov.vn/quychuan/view?sohieu=QCVN+07%3A2009%2FBTNMT>

- Third, the state management of compliance with the "four-correct" principle in crop production is ineffective due to the lack of regulations on the responsibility of users of fertilizers and plant protection products in cultivation. Currently, in the laws directly related to the use of chemicals in cultivation, there are very few regulations on the responsibility of chemical users in agriculture in general and in cultivation in particular. Meanwhile, according to World Bank statistics, the proportion of people working in the agricultural sector accounts for more than 36% of Vietnam's population as of 2020³⁷, but regulations on the responsibility of farmers in the use of chemicals in cultivation and animal husbandry is still general, lacking in specificity and binding. It is reflected in the fact that the current regulations on the obligations of users of chemicals in cultivation only revolve around very general contents, including *compliance with the provisions of the law on principles of fertilizer use and plant protection products; obligation to use plant protection products according to the list of products permitted for circulation; applied measures to limit consequences and notify competent agencies when detecting plant protection products causing harmful consequences for humans and the environment; preservation and collection of plant protection product packages after causing harm and compensation for damage caused by improper use of plant protection products*³⁸. The content obligations of chemical users in cultivation are many but very lacking. For example, the law stipulates that the competent authority must organize training, guidance, education and propaganda for farmers to use fertilizers and plant protection products. However, no regulations require farmers to use fertilizers and plant protection products to attend these classes or sessions. Even clause 2, Article 54 of the Cultivation Law, which directly stipulates the obligations of fertilizer users, is simple and does not require farmers to attend training courses on the use of fertilizers and plant protection products organized by competent agencies³⁹. It makes the fact that farmers are unwilling to participate in these sessions of training, instructions, education and propaganda⁴⁰, making their knowledge about the use of fertilizers and plant protection

³⁷ Vietnam – Employment in Agriculture (% Of Total Employment) <https://tradingeconomics.com/vietnam/employment-in-agriculture-percent-of-total-employment-wb-data.html>

³⁸ Clause 2, Article 72 of Plant Protection and Quarantine Law and similar contents in clause 2, Article 30 of the Chemicals Law, clause 2, Article 7 of the Food Safety Law.

³⁹ The Cultivation Law specified in clause 2, Article 54: "2. Organizations and individuals that use fertilizers have the following obligations: a) Use fertilizers strictly according to the instructions inscribed on the labels; b) Use fertilizers that are effective and safe for humans, livestock, the environment, and food safety according to the principles of the correct type of soil, the correct type of plant, the correct dose, the correct period, the correct method".

⁴⁰ Although farmers' propaganda, training and guidance in using chemicals in cultivation are only sometimes formal training sessions directly with instructors but also presented through propagating leaflets. However, specific and complete information and propaganda leaflets cannot be as guaranteed as attending training classes on the use of

products in cultivation not high, leading to the arbitrary use of chemicals in cultivation today⁴¹. This ignorance and arbitrariness of farmers make the state management of the use of chemicals in cultivation more difficult in practice, and the crop products become unsafe. In addition, farmers' obligations in using fertilizers must be “*correct plant, correct dose, correct period, correct method*”; although it is regulated by clause 2, Article 54 of the Cultivation Law, this law or related laws on the obligations of users of chemicals in cultivation⁴² does not have any regulations that require users of fertilizers and plant protection products in cultivation to comply with the technical regulations and standards on using fertilizers and plant protection products for each crop type according to Vietnamese Standards and Regulations. It also makes farmers not know that the cultivation of crops in Vietnam and the dosage and time of fertilizers or pesticides are regulated mainly⁴³. Most of the planting, tending and harvesting of agricultural products are done by farmers through word of mouth, leading to the use of fertilizers or plant protection products that do not follow technical regulations. Thus, the lack of regulations on obligations for growers in complying with technical regulations and standards in cultivation makes farming uncontrollable, polluting the environment and causing severe harm to the quality of crop products on the market and affecting consumers' health.

- *Fourth, the regulations on handling administrative violations in fertilizers and plant protection products and the criminal handling of this behaviour are still simple; the punishment is not enough of a deterrent.* Currently, according to the provisions of the 2012 Law on Handling of Administrative Violations, amended and supplemented in 2022, when organizations and individuals violate regulations on fertilizers, the maximum fine is VND 100,000,000 (one hundred million Vietnamese dong, equivalent to USD 4,100.00). This Law has no provisions for handling violations for using plant protection

chemicals in cultivation. (Responsible use of chemicals and plant protection products in growing vegetables, Ministry of Agriculture and Rural Development https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjQwtT_pIP_AhX-E1kFHxwIAUgQFnoECAgQAOQ&url=http%3A%2F%2Fwww.nafiqad.gov.vn%2FPortals%2F0%2FDOCUMENTS%2FTruyenthong%2Fsd-hoa-chat-thuoc-bvtv-co-trach-nhiem-trong-trong-rau.pdf&usq=AOvVaw0I0f4Fqd-bjzATvrFpTDsi)

⁴¹ See also Section 2.2. of this article about farmers' arbitrary use of fertilizers and plant protection products.

⁴² Clause 2, Article 30 of the Chemicals Law, Article 72 of Plant Protection and Quarantine Law, clause 2, Article 7 of the Food Safety Law.

⁴³ For example, refer to Technical Procedures for planting, caring for and harvesting coffee and tea according to Industry Standard 10 TCN 527:2002 on technical procedures for planting, caring for and harvesting coffee and tea issued by the Ministry of Agriculture and Development issued, can see that all requirements on suitable soil type, cultivation techniques, dosage and period of application of fertilizers and plant protection products have all been regulated and guided in detail by the Ministry of Agriculture and Rural Development. (Technical procedure of planting, caring and harvesting coffee <https://vanbanphapluat.co/10-tcn-527-2002-quy-trinh-ky-thuat-trong-cham-soc-va-thu-hoach-ca-phe-che>)

products. However, Decree No. 115/2018/ND-CP of the Government, issued on September 4, 2018, Regulations on administrative sanction in food safety in Article 6 stipulates that if the production of food violates the regulations on the use of chemicals and plant protection products, the maximum fine is VND 100,000,000 and the production may be suspended for up to 12 months. These penalties are still very light and need to be sufficiently deterrent, especially if the violators are not individuals or households but food production organizations. At the same time, the crime specified in the Vietnam 2015 Penal Code, amended and supplemented in 2017 (Article 317, crime of violating regulations on food safety), is currently only handled for individuals who commit acts of violating the use of chemicals in cultivation to the extent that it constitutes a crime without dealing with commercial legal entities. Meanwhile, if commercial legal entities perform these acts, the danger and consequences are much greater than those caused by individuals. Therefore, the fact that the current criminal law only stops at handling individuals is not fair and inadequate.

- Fifth, there need to be more regulations on limiting chemical fertilizers and plant protection products and encouragement for using organic fertilizers, micro-fertilizers and plant protection products of biological origin and environmentally friendly learning. Although there are regulations on state policies to support the production of organic fertilizers, microbiological fertilizers and biological plant protection products⁴⁴, chemical fertilizers and plant protection products still dominate the market. According to statistics, by the end of 2020, the whole country has 241 chemical fertilizer production establishments with a capacity of 5.06% tons/year (accounting for 87.2% of the total fertilizer volume of the country; the rest is organic fertilizers accounted for 12.8%; for plant protection products, the whole country used 41,870 tons of chemical pesticides (accounting for 82.59% of the total amount of plant protection products used in this year)⁴⁵. The lack of policies by the state to promote the development of organic fertilizers, microbiological fertilizers and biological plant protection products has made the use of chemicals in cultivation more prevalent, leading to the situation that crop products are not safe for consumers' health.

⁴⁴ Points a and d, clauses 2 and 3, Articles 4 and 6 of the Cultivation Law and Chapter VI of Decree No. 109/2018/ND-CP of the Government, dated August 29, 2018, on Organic agriculture.

⁴⁵ The Mekong Delta uses chemical fertilizers and plant protection products excessively, Canh Ky, 2021, <https://tienphong.vn/vung-dbscl-su-dung-phan-bon-hoa-hoc-thuoc-bao-ve-thuc-vat-qua-muc-post1370164.tpo>

2.2. Regarding practice

In addition to the state management's facing many difficulties because the provisions of the law are not appropriate as above, the state management in the use of chemicals in cultivation is also faced with many challenges due to the following factors:

- *Firstly, farmers arbitrarily use fertilizers and plant protection products*⁴⁶. According to the Plant Protection Department of the Ministry of Agriculture and Rural Development, the statistics for September 2021 show that the average amount of fertilizer used for 1 hectare in the Mekong Delta region is 1,071 kg/ha, which is 42% higher than the national average⁴⁷. In particular, provinces like Ben Tre have used inorganic fertilizers nearly 4 times higher than the national average. Similarly, with chemical plant protection products, the amount used in this area is 71.9% higher than the national average; Tien Giang and Dong Thap have a high used chemical plant protection rate, approximately 3 times higher than the national average⁴⁸. It shows farmers' arbitrariness in using fertilizers and plant protection products.

- *Secondly, farmers use toxic chemicals on the market to produce agricultural products*. Many types of chemicals on the market serve all areas of social life. According to the Department of Chemicals, by the end of 2022, in Vietnam, about 52,000 chemicals are circulating on the market⁴⁹, and farmers are willing to use any chemical as long as it is cheap and effective quickly in killing weeds, preventing pests and stimulating plant growth. However, these numbers are just statistics. In addition to these enumerable chemicals, many illegally imported chemicals may also exist that the users mix, combine with other chemicals, and use in farming. Growers are willing to use industrial waste chemicals, such as waste slime, to eliminate brown planthoppers⁵⁰, even toxic chemicals of unknown origin, to grow crops⁵¹.

⁴⁶ Many dangers from the misuse of herbicides, June 10, 2017, <https://vtv.vn/trong-nuoc/nhieu-moi-nguy-hai-tu-tinh-trang-lam-dung-thuoc-diet-co-20170610151843235.htm>

⁴⁷ Publicizing the use of plant protection products to build transparent agriculture, Phan Hau, 2021, <https://thanhnien.vn/cong-khai-viec-su-dung-thuoc-bao-ve-thuc-vat-de-xay-dung-nen-nong-nghiep-minh-bach-1851386753.htm>

⁴⁸ Arbitrary fertilization and spraying – unpredictable consequences, Le Hai, 2021, <http://baotnvn.vn/tin-tuc/Kinh-te/14162/Tuy-tien-bon-phan-phun-thuoc--he-luy-khon-luong>

⁴⁹ Chemical management has many shortcomings, Vu Khue, 2021, <https://vneconomy.vn/quan-ly-hoa-chat-con-nhieu-bat-cap.htm>

⁵⁰ Farmers dabble the water spinach with lubricating oil to... kill pests, 2016, <https://vtv.vn/xa-hoi/nong-dan-tuoi-nhot-len-rau-muong-de-diet-sau-20160119110826853.htm>

⁵¹ Where does the strange liquid that Vinh Phuc people dabble crops come from? Nguyen Son, 2017, <https://vtv.vn/chuyen-dong-24h/dung-dich-la-nguoi-dan-vinh-phuc-tuoi-cho-hoa-mau-co-nguon-goc-tu-dau-20170815160657487.htm>

- Thirdly, artificial fertilizers, poor-quality fertilizers and toxic chemicals are still rampant in the market. They cannot be traced, making it impossible for users to choose or distinguish high-quality fertilizer products. According to statistics, Vietnam's agricultural industry loses USD 2.5 billion annually because of artificial and poor-quality fertilizers⁵². It stems from many reasons, the most important of which is the weakness in the inspection and examination by competent authorities. Besides, the fact that small retail shops freely extract fertilizer from the manufacturer's fertilizer bags also makes it easier to mix fake and poor-quality fertilizers. The traceability of fertilizers, plant protection products in particular and commodities in general could be more convenient and more popularized, which is also a challenge for farmers when searching to buy genuine fertilisers and pesticides.

In general, the inadequacies of the use of fertilizers and plant protection products in agricultural production are mainly related to the use of inappropriate fertilizers (including the use of artificial fertilizers, poor quality fertilizers, etc., and plant protection products on the banned list or not on the list permitted for circulation), violating the dose, period and method of using fertilizers. All of the above violations more or less lead to producing poor quality agricultural products, even toxic to consumers' health, affecting the ecological environment and damaging plant genetic resources. All these consequences lead to encroachment on the sustainable development of cultivation in particular and the agricultural sector in general.

All the above shortcomings are just some of the many inadequacies of using fertilizers and plant protection products in Vietnam. No matter the content, these inadequacies show the need for more legal regulations on state management of the use of chemicals in cultivation. Therefore, the need to improve the Vietnamese law on the use of chemicals in cultivation, especially at the state management stage of this content, is an essential need to be discussed.

3. Some proposed solutions for the state management of the use of chemicals in cultivation in Vietnam

In order to improve the state management of the use of chemicals in cultivation in Vietnam, the first important content that needs to be taken into account is the completion of the legal provisions. From the legal inadequacies mentioned, shortly, legislators need to study to amend the following contents:

⁵² Difficulty in controlling the fertilizer market, 2023, <https://vtv.vn/xa-hoi/gian-nan-kiem-soat-thi-truong-phan-bon-20230207232019391.htm>

- *Firstly, it is urgent to promulgate Vietnam Agriculture Law.* In order to solve the overlapping and intertwined state management authority over the use of chemicals in cultivation, it is necessary to promulgate the Agriculture Law. The law of Vietnam has promulgated the 2018 Cultivation Law and the 2018 Livestock Law. Although these two laws are two areas of agricultural activities, because these two laws exist, the Agriculture Law has yet to be enacted. However, when the Agriculture Law is promulgated, it will synchronously solve the problem of using chemicals in cultivation in particular and Vietnam's agriculture in general. Accordingly, regulations on state management of the use of chemicals in cultivation will be concentrated on a single focal point, namely the Ministry of Agriculture and Rural Development, and then interference, overlapping, and conflict of interest will be resolved. In addition, when the Agriculture Law is formulated and promulgated, it also solves the following inadequacies and other issues of Vietnam's agriculture in general and cultivation in particular.

- *Secondly, to ensure the use of fertilizers and plant protection products according to the "four-correct" principle* as prescribed in the Plant Protection and Quarantine Law, in addition to recognising this *four-correct* principle in the Agriculture Law mentioned above, the state needs to continue to improve the following contents:

+ *First, to complete the National Technical Regulations and Vietnamese Standards* in the direction of supplementing early and successively until all the procedures and standards for the cultivation, care and harvesting of crops are completed, in which detailed instructions on fertilizers and plant protection products, process, usage, dosage and isolation period. The Regulations and Standards must have a new update in combination with the world's regulations and standards⁵³, in which it is urgent to develop standards for determining the maximum residue levels of plant protection products for crop products. When fully supplemented and detailed, these regulations and standards will be precise requirements on planting, caring and harvesting techniques for agricultural products, including clear instructions on using fertilizers and plant protection products for crops in each growth stage. These regulations and standards are necessary knowledge that farmers must learn to ensure technical factors in using fertilizers and plant protection products in cultivation, thereby contributing to eliminating the arbitrary use of chemicals in cultivation.

⁵³ For example, the collection and treatment of plant protection products packaging must comply with the provisions of the Stockholm Convention on Persistent Organic Pollutants.

+ *Second, to supplement the responsibilities of users of fertilizers and plant protection products.* The Agriculture Law also needs to stipulate the contents of farmers' obligations in using chemicals in cultivation to add two essential obligations to them, including: (1) it is mandatory for at least 01 grower in each household to annually attend at least one training session, instructing the use of fertilizers and plant protection products, and (2) growers are obliged to comply with the technical regulations and standards related to the varieties of plants they grow to ensure that the planting, care and harvesting meet product quality and not pollute the environment. These solutions, combined with those mentioned above, will improve growers' knowledge about producing quality agricultural products with food safety and sustainable agricultural development.

- *Thirdly, it is necessary to amend the regulations on handling violations using fertilizers and plant protection products.* This content includes two issues: handling administrative violations and criminal handling. As follows:

+ *First, for handling administrative violations in the field of using chemicals in cultivation:* The state needs to increase the level of penalties and administrative sanctions for those violating the regulations on administrative violations use of fertilizers and plant protection products in cultivation. In order to do this, the Law on Handling of Administrative Violations considers individuals and households violating regulations on the use of fertilizers and plant protection products 05 times higher than the current maximum level of VND 100,000,000 and simultaneously confiscates and destroys all unsatisfactory crop products. For farming organizations, depending on the severity of the violation, a maximum fine of VND 5,000,000,000 and a permanent ban on operation will be imposed in addition to the above two sanctions.

+ *Second, for the criminal handling of violations on the use of chemicals in cultivation:* When this violation becomes a crime according to the provisions of Article 317 of the 2015 Penal Code (amended and supplemented in 2017), dealing with commercial legal entities is necessary. However, it cannot stop at only handling violators, whereby fines and confiscation of assets of these legal entities need to attack to the extent that the legal entity must go bankrupt and cease its business operations permanently. Applying strict and firm sanctions as proposed can contribute to reducing violations of chemical use in cultivation in the current context.

- *Fourthly, there should be more preferential policies for producing and importing organic fertilizers, microbiological fertilizers and biological plant protection products*

and reducing the use of fertilizers and plant protection products in cultivation. These policies include incentives for taxes, customs⁵⁴, land lease conditions, etc., to attract resources to focus on producing and importing fertilizers and plant protection products of non-chemical origin science, which is one way to reduce the use of chemicals in cultivation.

- *Fifth, it is necessary to strengthen the inspection, examination and handling of violations, propaganda and dissemination of cultivation knowledge.* In addition to the contents that the law on state management of the use of chemicals in cultivation needs to be amended and supplemented as above, competent state agencies need to take parallel measures such as increasing and strengthening inspection and inspection activities for growers; boldly and strictly handling violations in regulations on state management of fertilizers and plant protection products; regularly carrying out measures to train, propagate and disseminate knowledge about cultivation in each region at the commune level for growers.

- *Sixthly, the implementation of digitalization in agriculture in general and cultivation in particular should be conducted.* The government needs to study agricultural digitization contents such as completing the database on chemicals, fertilizers, and plant protection products with contents on classification, usage, etc. It should include information related to the manufacturer and the ability to access the origin of fertilizers and plant protection products to ensure the reliability of fertilizers and plant protection products confused with artificial fertilizers or poor-quality plant protection products. In addition, digitization needs to be reflected in the further development of applications that support access to information on fertilizers and plant protection products, with access to a set of Technical Standards and Regulations to assist growers in updating the necessary information to support clean agricultural production.

The above-proposed solutions are just some immediate solutions to address the main inadequacies in state management of using chemicals in cultivation in Vietnam. For these solutions to be feasible, they must be studied into detailed regulations and disseminated to users of fertilizers and plant protection products in cultivation. In addition, it is necessary to study in parallel and synchronously other solutions, such as training and arranging more agricultural extension officers of each commune to guide farmers in the correct use of chemicals in cultivation; arrange a convenient place to

⁵⁴ Refer to agricultural preferential measures in the customs procedures of Agreement on Agriculture (AoA). (WTO Agreement on Agriculture (AoA) http://agro.gov.vn/vn/tID15078_Hiep-dinh-Nong-nghiep-cua-WTO-AoA-.html)

collect packages of fertilizers and plant protection products after use in the communes to ensure the collection and treatment of solid waste related to chemicals in cultivation, etc. As mentioned earlier, the measures and other parallel solutions implemented synchronously will be an essential foundation for the state management of the use of chemicals in cultivation in Vietnam, a necessary condition to ensure clean, safe agriculture for domestic consumers and towards international markets and sustainable agricultural development.

4. Conclusion

Ensuring state management over the use of chemicals in cultivation is essential for clean and sustainable agriculture, especially for an agricultural country like Vietnam. Although the Vietnamese law on Chemicals and chemical use in cultivation, including fertilizers and plant protection products, has been regulated in the Chemicals Law and other related laws such as the Plant Protection and Quarantine Law, The Cultivation Law and the Food Safety Law, in particular on the state management of using chemicals in cultivation (fertilizers and plant protection products), these laws still have many shortcomings. In addition to the inadequacies in terms of the law, the inadequacies directly related to the state management of the use of fertilizers and plant protection products in cultivation are also reflected in the practical application. The main shortcomings can include:

- First, the overlapping and interlacing regulations on state management responsibilities for using chemicals in cultivation. The regulations on the use of chemicals in cultivation are concurrently regulated in the Chemicals Law, the Plant Protection and Quarantine Law, the Cultivation Law and the Food Safety Law with the simultaneously professional management of the Ministry of Industry and Trade, Ministry of Health, Ministry of Agriculture and Rural Development, and Ministry of Natural Resources and Environment. It creates a conflict of authority in the state management of chemicals in cultivation in some instances;

- Second, the National Technical Regulations and Vietnamese Standards related to techniques and procedures for growing, caring and harvesting agricultural products and other related processes are currently lacking, outdated, and not easily accessible to farmers. Even the information on planting, caring for and harvesting agricultural products covers only some common plants. It makes growers who want to implement the “*four-correct*” principle in using fertilizers and plant protection products but do not know how to do it or do not have enough access to information themselves. The lack of technical

Regulations and Standards also makes the agency competent to manage the state management of the use of fertilizers and plant protection products in cultivation without sufficient grounds to determine whether farmers have violated technical regulations and standards on fertilizers and plant protection products in cultivation, if so, which standards and regulations are violated;

- Third, the current law related to the state management of the use of chemicals in cultivation shows the need for more regulations on growers' responsibility in using fertilizers and plant protection products ignorantly and arbitrarily by growers to create agricultural products that are unsafe for human health and cause environmental pollution. The lack of these regulations for chemical users makes violations of this chemical use more common in practice and challenging for the state to control;

- Fourth, the regulations on sanctioning administrative violations and criminal sanctions for violations are still very light and not enough of a deterrent and prevention. At the same time, policies to limit fertilizers and chemical plant protection products and develop fertilizers and plant protection products of organic or biological origin need to be more robust and transparent to attract fertilizer producers and users to switch to organic or microbial fertilizers and plant protection products.

In order to solve these inadequacies and better protect human health, protect the ecological environment in general and further strengthen the role of state management in using chemicals in cultivation, the article has made the following recommendations:

- First, it is necessary to promulgate the Agriculture Law soon. This law, when promulgated, will solve a series of issues of overlapping and interlacing authority in the state management in using chemicals in cultivation and a series of other essential issues, such as clear and detailed regulations of the state responsibility in strengthening state management, inspection, examination, training and propaganda on the use of chemicals in cultivation. This law also needs to supplement and clarify the obligations of users of fertilizers and plant protection products in agriculture and many other contents in cultivation in particular and in agriculture in general.

- Second, it is necessary to soon complete the National Technical Regulations and Vietnam Standards on the procedures for planting, caring and harvesting crops, including detailed instructions on fertilizers and plant protection products, dosage, period of application and isolation after application of fertilizers for each type of plant. This improvement includes adding missing processes and updating new information for old

processes. In addition, the Regulations and Standards completion also includes other procedures related to fertilizers and plant protection products, such as the maximum residues setting procedure of plant protection products in agricultural products or chemical waste treatment procedure in cultivation, etc.

- Third, it is necessary to build a national data system on chemicals in general and fertilizers and plant protection products in particular, focusing on setting up smartphone applications to support farmers to search for information, instructions for use and traceability for fertilizers and plant protection products. These applications need to have a link with the Vietnamese Technical Standards and Regulations as well as the ability to connect with international conventions and treaties on fertilizers and plant protection products. It will help farmers quickly, focus and easily get knowledge in using fertilizers and plant protection products in cultivation, thereby creating favourable conditions for the state management to produce quality fruits and vegetables meeting domestic and international demand.

- Fourth, it is necessary to strengthen the examination, inspection, training, coaching and consulting on using chemicals in cultivation. The handling of violations of the law on the use of fertilizers and plant protection products must be strict to ensure deterrence. When done well, these acts will effectively support the state management of the use of chemicals in cultivation.

In general, improving the quality of agricultural products in general and Vietnamese agricultural products in particular is an indispensable need in the context that Vietnam and other countries are gradually implementing environmentally friendly organic agriculture. Only when Vietnamese farmers can produce quality crop products to meet the international market will cultivating agricultural products in Vietnam enter the sustainable development process. To achieve this goal, many parallel solutions are needed, the first of which is to focus on improving state management's responsibility for using fertilizers and plant protection products. Therefore, focusing on completing the legal regulations on state management in this field and investing in policies to support farmers, such as consulting, agricultural extension, and digitalization of Vietnamese agriculture, are requirements for the context of cultivation in Vietnam today.

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