

The Especially Hazardous Pesticides in Uzbekistan

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Abstract

The article discusses the dangerous pesticides used in the Agriculture of Uzbekistan, including extremely dangerous pesticides. There is also an excellent supply of available natural resources and a sharp continental climate. The purpose and objectives of the article are to provide information on the use of hazardous pesticides in agriculture, which is one of the main sectors of the economy of Uzbekistan, and their characteristics and achievements in their use.

Keywords: *Republic, pesticides, especially hazardous, territory, agriculture, output, climate, products, indicators, economic, natural resources.*

INTRODUCTION

The largest rivers are Amudarya and Syrdarya. The total length of the Amudarya is 1437 km, and Syrdarya is 2137 km. A wide range of Minerals has been identified on the territory of the Republic of Uzbekistan, including about 100 types of mineral raw materials, 60 of which are already used in the national economy. Uzbekistan occupies a leading position in the world in terms of proven reserves of minerals such as gold, uranium, copper, natural gas, tungsten, and potassium salts, as well as extremely dangerous pesticides used at the national level – phosphorites and kaolins.

Description of the methods and techniques used to collect and analyze the original data. The Republic of Uzbekistan is located between the

Amudarya and Syrdarya rivers and covers an area of 448.9 thousand square meters. km. The length of the territory of the republic from west to east is 1425 kilometres, and from north to south - 930 kilometres (Fig. 1 and Fig. 2).

Fig. 1. Map of Uzbekistan

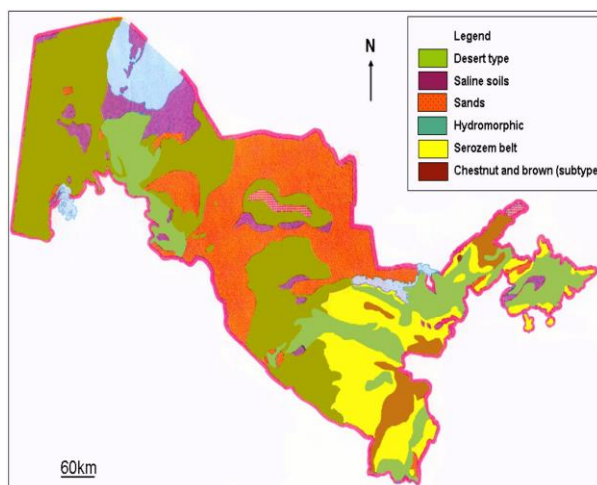


Borders: The territory borders Kazakhstan in the north and northeast, Kyrgyzstan and Tajikistan in the east and southeast, Turkmenistan in the west, and Afghanistan in the south. The total length of the state border is 7090.12 km. The length of the borders with Afghanistan is 143 km, with Kazakhstan 2,356.31 km, Kyrgyzstan 1,476.12 km, Tajikistan 1,283.2 km and with Turkmenistan 1831.49 km. Most of the territory of Uzbekistan is occupied by plains (about four-fifths of the territory). In the north of the central part of the territory of Uzbekistan, there is one of the largest deserts in the world - Kyzylkum, in the west - Karakum. Mountains and foothills make up about 1/5 of the territory of the republic. Desert vegetation prevails on the plains, and steppes, forests, and mountain meadows dominate in the mountains.

The climate of Uzbekistan is sharply continental. It is characterized by the sharp amplitude of day and night, summer and winter temperatures. The difference in temperature depending on the time of the year is quite significant. The average January temperature drops to -6°C , while the average July temperature rises to $+32^{\circ}\text{C}$. The average annual amount of precipitation falling on the plains is 120-200 mm, and in mountainous regions 1000 mm. Rainfall is negligible, so agriculture is more dependent on irrigation [1].

Inland waters. The largest rivers are the Amudarya and the Syrdarya. The total length of the Amudarya is 1437 km, and the Syrdarya is 2137 km. A wide range of minerals has been identified on the territory of the Republic of Uzbekistan, including about 100 types of mineral raw materials, of which 60 are already used in the national economy. For proven reserves of minerals such as gold, uranium, copper, natural gas, tungsten, and potassium salts.

Fig.2. Soil map of Uzbekistan



Particularly hazardous pesticides, used at the national level are phosphorites, and kaolins, Uzbekistan occupies a leading position in the world [1-8].

So, in terms of gold reserves, the republic ranks fourth in the world, and in terms of its production - seventh place, in terms of copper reserves - tenth - eleventh place; uranium - seventh - eighth place, and in terms of its production - eleventh - twelfth place. Administratively and territorially, Uzbekistan consists of the Republic of Karakalpakstan and 12 regions. The capital is Tashkent. In terms of the number of inhabitants (about 33 million people in 2018), Uzbekistan ranks third among the CIS countries, after the Russian Federation and Ukraine. The average population density is 65.8 people. per 1 sq. km [3].

The bulk of the population is Uzbeks, who account for almost 80% of the total population. Uzbekistan is a multinational republic, representatives of more than 100 nations and nationalities live here (Table 1) [8].

Uzbekistan is a middle-income country and one of the fastest growing economies in Eastern Europe and Central Asia region. Recent institutional reforms have created a solid

institutional framework for increased coordination among the ministries responsible for infrastructure and the environment. Strategic documents, such as the Action Strategy for the Five Priority Directions of Development of the Republic of Uzbekistan in 2017-2021, set out a clear vision for the development of Uzbekistan in the next five years, and the Strategy includes specific profile plans for sectors of the national economy. Uzbekistan is endowed with significant land and energy resources and has taken steps in recent years to develop its agricultural sector in parallel with the broader liberalization of its economy.

Descriptive part

The main sectors in the economy are agriculture, automotive, chemical, electrical, mining, energy, light, oil and gas industries [4-7, 9-15].

Of the total agricultural area, about 16.3% (4.4 million ha) are arable, 82.4% (22 million ha) are classified as permanent grasslands and pastures, and 1.3% (350,000 ha) are planted with permanent (perennial) or plantation crops. Crops produced in Uzbekistan include cereals (33% of the cultivated area), followed by oilseeds (27%), fibre crops (26%), horticulture (12%) and other crops (2%) (Table 1).

Table 1. Main indicators of the economy of Uzbekistan [16,17]

Population (2018)	32955400
Urbanization rate (2018)	50.5%
Annual population growth (2018)	1.7%
The area of the land	447400 km ²
GDP (in USD at current 2018 prices)	50500 million
GDP per capita (in current 2018 US dollars)	1532
Real GDP growth (annual change in 2018)	5.1%
Inflation (average consumer price, annual change)	n.a.
Export of goods and services (% of GDP in 2018)	29.1%
Imports of goods and services (% of GDP in 2018)	38.7%
FDI, net inflows (% of GDP in 2018)	1.2%
General government net lending/borrowing (% of GDP in 2018)	0.9%
Unemployment (% of the total labour force in 2018)	5.2%
Remittances (% of GDP in 2016)	3.0%
Public Sector Transparency, Accountability and Corruption Rating (1=very corrupt, 6=least corrupt in 2017)	2

The annual water supply in Uzbekistan is about 16 billion m³, of which about 9.5 billion m³ is classified as domestically produced surface water, and 8.8 billion m³ comes from domestically produced groundwater, with an overlap of 2 billion m³. The country's internal water resources originate from the rains and runoff of the four rivers that form the Aral Sea basin: the Amudarya, Syrdarya, Kashkadarya and Zarafshan. In Uzbekistan, only 20.7% of agricultural land is irrigated. Over the past 15

years, the availability of irrigated land per capita has decreased by 24%, this is due to population growth, a decrease in water supply and the transfer of agricultural land to other categories of land funds. Over 60% of the irrigated area of 4 million hectares in the country is considered saline soil, and about 30% is considered medium or high saline soil. Soil salinization is exacerbated by the fact that the irrigation system is poorly maintained and

a growing percentage of field drainage systems fail and are difficult to restore.

At the same time, agriculture is the leading branch of the economy of Uzbekistan. It provides jobs for 3.6 million people, which is 27% of the total number of employees. The industry accounts for 32% of the Republic's GDP. The main indicators of agriculture, including growth rates, structure, and volumes by region are in the appendix [1-12].

In 2019, water-saving irrigation technologies were introduced on 25,000 hectares of cotton fields. Large-scale work has begun on the reclamation of 1 million 100 thousand hectares of degraded land. 90 per cent of all agricultural production falls on the non-state sector - about 80.1 thousand farms operate in the country, to which more than 3.8 million hectares of land are assigned. About 11.5 million tons of vegetables were grown throughout the country in 2018, of which 441.5 thousand tons were exported. In 2019, 7 million 130 thousand tons

of grain, 2 million 845 thousand tons of cotton, 19 thousand 600 tons of cocoons, 21 million tons of fruits and vegetables, and 400 thousand tons of rice. To introduce new technologies and innovations, and increase labour productivity and clusters. Starting in 2020, a decision was made to grow 100 per cent cotton using the cluster method. Along with this, the creation of clusters in fur farming, horticulture, poultry farming, animal husbandry, fish farming, and sericulture will continue consistently. Since 1991, the volume of agricultural production has more than doubled, which allowed Uzbekistan to get into the top 50 exporting countries in the agricultural sector.

Today, more than 80 states are importers of Uzbek agricultural products. Uzbekistan is a major exporter of more than 150 types of fresh and processed fruits and vegetables. In 2019, 1.3 million tons of fruits and vegetables worth \$1 billion and 100 million were exported (Table 2).

Table 2. Export volumes of domestic fruits and vegetables in the period 2017-2018

№	Products	2017			2018			Price changes 2017/2018
		Volume, thousand tons	Amount, million USD	Average price USD/t	Volume, thousand tons	Amount, million USD	Average price USD/t	
1.	Vegetables	227.9	107.4	471.3	441.3	145.7	330.2	70.06%
2.	Fruits	209.5	189.1	902.6	240.1	313.9	1307.4	144.84%
3.	Grape	195.7	144.8	739.9	205.9	178.9	868.9	117.43%
4.	Legumes	127.4	96.1	754.3	203.2	143.4	705.7	93.56%
5.	Dried products	79.4	79.3	998.7	113.6	92.1	810.7	81.18%
6.	melons	28.3	3.4	120.1	33.4	9.9	296.4	246.72%
	Total	868.2	620.1	714.2	1237.5	883.9	714.3	

In 2019, the Concept for the Efficient Use of Land and Water Resources in Agriculture and the Strategy for the Development of the Sphere for the Next 10 Years was adopted. On October 21, 2019, by the Decree of the President of the Republic of Uzbekistan, the “Strategy for the

Development of Agriculture of the Republic of Uzbekistan for 2020-2030” was approved, which defines the strategic priorities for the development of agriculture and the main indicators for achieving the goals of the

strategy, the implementation mechanism, and approved the corresponding “Road Map”.

It is planned to implement the concept of diversification of agriculture, developed with the involvement of experts from the American Boston Consulting Group (BCG). The main task of agricultural development in the future is the introduction of market principles in the cotton and grain industries, strengthening the feeling of land ownership, the development of breeding and seed production, plant protection and the development of diversified farms [14, 15].

Mechanisms for the safe handling of chemicals, including registration, and licensing to prevent the formation of stocks of hazardous chemicals in the country (primarily pesticides) are provided by the Laws of the Republic of Uzbekistan “On Narcotic Drugs and Psychotropic Substances” and “On the Protection of Agricultural Plants from Pests, Diseases and weeds.” These mechanisms are also regulated by the Decree of the Cabinet of Ministers of the Republic of Uzbekistan “On the import, export and transit through the territory of the Republic of Uzbekistan of narcotic drugs, psychotropic substances and precursors”, Annex to the Decree of the Cabinet of Ministers of July 25, 1995 “List of specific goods, the import of which is carried out under licenses issued by the Ministry of Foreign Affairs of the Republic of Uzbekistan”.

The system of legislation related to the production, use, and storage of chemicals and the responsibility of individuals and legal entities, mainly contributes to the expansion of self-regulatory mechanisms in ensuring the safe handling of chemicals.

Activities related to the safe handling of chemicals are carried out by the Cabinet of Ministers of the Republic of Uzbekistan (local

authorities at different levels), the Ministry of Health, the Ministry of Agriculture, the State Committee for Ecology and Environmental Protection, the State Chemical Commission, the Customs Committee, the Ministry of Internal Affairs, bodies security and civil self-government. The key ministries exercising control and defining criteria for the safety of chemicals in relation to humans and the environment are the State Committee for Ecology and Environmental Protection, the Ministry of Health, the Ministry of Agriculture, etc.

The Law “On the Protection of Agricultural Plants from Pests, Diseases and Weeds” [13] regulates relations related to ensuring the protection of agricultural plants from pests, diseases and weeds, preventing the harmful effects of plant protection products on human health and the natural environment.

Currently, a draft new Law “On the Protection of Agricultural Plants from Pests, Diseases and Weeds” (38) has been prepared and passed public discussion, one of the main goals of which is the task of preventing “the harmful effects of pesticides and agrochemicals on human health, the natural environment”. Following the Decree of the Cabinet of Ministers of the Republic of Uzbekistan “On measures to improve the system of testing and registration of chemicals and plant protection products” dated September 5, 2019. 735, the State Commission for Testing and Registration of Chemicalization and Plant Protection Agents under the Ministry of Agriculture was established. The working body of the transformed structure is the legal successor of the State Commission for Chemicals and Plant Protection Products under the Research and Production Center for Agriculture and Food. The chairman of the commission is the Minister of Agriculture.

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On May 8, 2019, the country adopted the Law "On Ratification of the Stockholm Convention on Persistent Organic Pollutants" The State Committee of the Republic of Uzbekistan on Ecology and Environmental Protection is the competent authority responsible for the

implementation of the Stockholm Convention on Persistent Organic Pollutants.

Montreal Protocol - the competent authority is the State Committee of the Republic of Uzbekistan on Ecology and Environmental Protection. SAICM - the State Committee of the Republic of Uzbekistan on Ecology and Environmental Protection by the competent body of the coordinator. Concepts of environmental protection of the Republic of Uzbekistan until 2030 (October 30, 2019) and the Decree of the Cabinet of Ministers of the Republic of Uzbekistan "On approval of the national action plan of the Republic of Uzbekistan on the implementation of international documents in the field of ensuring chemical, biological, radiation and nuclear safety for 2018 - 2021" provides the possibility of accession of Uzbekistan to the Rotterdam Convention (table 3).

Table 3. Data on HHPs allowed for use in Uzbekistan (as of December 31, 2019) but already banned in other countries, prepared in accordance with PAN International Consolidated List of Banned Pesticides (March 2019) [17]

PAN number	CAS number	HHPs	Total number of countries with active ingredient bans	PAN HHP	JMPM HHP
3.	71751-41-2	Abamectin		No information	
5.	34256-82-1	Acetochlor	38	X	
19.	1912-24-9	Atrazine	37	X	
27.	17804-35-2	Benomyl	34	X	X
30.	68359-37-5	Beta-cyfluthrin; Cyfluthrin	1	X	X
32.	82657-04-3	Bifenthrin	2	X	
36.	10043-35-3	Boricacid	28	X	X
37.	56073-10-0	Brodifacoum	30	X	X
42.	1689-99-2	Bromoxyniloctanoate	2	X	
50.	10605-21-7	Carbendazim	29	X	X
55.	500008-45-7	Chlorantraniliprole		No information	
66.	1897-45-6	Chlorothalonil	3	X	X
68.	2921-88-2	Chlorpyrifos	4	X	
69.	5598-13-0	Chlorpyrifos-methyl	1	X	
77.	68085-85-8	Cyhalothrin	28	X	

78.	76703-62-3	Cyhalothrin, gamma		No information
80.	52315-07-8	Cypermethrin		No information
81.	67375-30-8	Cypermethrin, alpha		No information
82.	65731-84-2	Cypermethrin, beta	28	X
83.	94361-06-5	Cyproconazole		No information
86.	52918-63-5	Deltamethrin		No information
96.	60-51-5	Dimethoate	4	X
129.	122-14-5	Fenitrothion	28	X
130.	72490-01-8	Fenoxycarb		No information
137.	90035-08-8	Fipronil	37	X
138.	90035-08-8	Flocoumafen	31	X X
139.	69806-50-4	Fluazifop-butyl	1	X X
156.	77182-82-2	Glufosinate-ammonium	28	X X
164.	78587-05-0	Hexythiazox		No information
167.	138261-41-3	Imidacloprid		No information
177.	91465-08-6	Lambda-cyhalothrin		No information
181.	12057-74-8	Magnesium phosphide	1	X
182.	121-75-5	Malathion	2	X X
183.	8018-01-7	Mancozeb	1	X X
198.	9006-42-2	Metiram		No information
199.	21087-64-9	Metribuzin		No information
215.	42874-03-3	Oxyfluorfen	1	X X
221.	40487-42-1	Pendimethalin	1	X
228.	918-02-1	Picloram	3	X
230.	29232-93-7	Pirimiphos-methyl		No information
237.	2312-35-8	Propargite	29	X X
239.	60207-90-1	Propiconazole	28	X X
240.	12071-83-9	Propineb	28	X X
244.	123312-89-0	Pymetrozine	30	X X
250.	96489-71-3	Pyridaben		No information
264.	168316-95-8	Spinosad		No information
265.	148477-71-8	Spirodiclofen		No information
272.	79538-32-2	Tefluthrin	1	X X
274.	149979-41-9	Tepraloxydim	28	X
279.	112281-77-3	Tetraconazole		No information
281.	111988-49-9	Thiacloprid		No information
282.	153719-23-4	Thiamethoxam		No information
286.	23564-05-8	Thiophanate-methyl		No information
293.	55219-65-3	Triadimenol		No information
300.	1582-09-8	Trifluralin	28	X
306.	52315-07-8z	Zeta-Cypermethrin		No information
307.	1314-84-7	Zinc phosphide	2	X X
14.	2385-85-5	Mirex (pesticide)		No information
15.	8001-35-2	Toxaphen (pesticide)		No information

Conclusion

Most drugs enter the market from enterprises in Uzbekistan (more than 40%), including 26

from joint ventures (about 26%). Medicines from 19 countries enter the Uzbek market. From foreign countries, Uzbekistan receives the most drugs from Turkey (about 16%),

China and Switzerland (8.4% each). There are 58 registrants and 249 drugs in total. Uzbek - 17, including 2 joint ventures.

There are 99 drugs in total. Of the Uzbek registrants, most of the drugs come from the Euro Team JV LLC (Uzbekistan-Germany) - 21.2%. Samo Farm Servis LLC and Ifoda Agro Kimyo Himoya LLC took 2nd place - 11.1% each. On the third - Agrokim LLC - 8%. Foreign registrants are 41 organizations in total - 156 drugs. Most drugs are registered by Syngenta Crop Protecting AG (Switzerland) - 9.9%, UPL Ziraat ve Kimya San.ve Tic. Ltd.Sti (Turkey) and Astra industrial complex (Saudi Arabia) - 6 each, 6%. Most registrants are from China, Turkey, Russia and Japan.

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