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Development of agriculture of Israel and pers-pectives of cooperation with Ukraine

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The purpose. To consider experience of development of agriculture of Israel in context of perspectives of cooperation with Ukraine. To analyze premises of intense development of agroindustrial sector of Israel. To determine achievements of agriculture of Israel. To show contemporary state of economic relations between Ukraine and Israel in agrarian sphere and to determine perspective directions of cooperation. **Methods.** Comparative-descriptive, historical-analytical, relevant, extrapolation. **Results.** It is specified that Israel is one of world leaders in innovative development of agriculture. In turn, Ukraine, having a significant environmental assets, goes out in world leaders of production of agricultural produce, in particular, in production of grain, sunflower and sunflower seed oil, poultry meat, other agricultural goods. Signing the Agreement on zone of free trade between Ukraine and Israel which preparation is at a completing stage will help to considerably intensify cooperation in agrarian sphere between two countries. Liberalization of trading regime between our countries will ensure diversification of Ukrainian export. Considering, that Israel traditionally is net-importer of Ukrainian agricultural products, in particular wheat, forage crops, sugar, olive crops, there is an interest in the maximum lowering rates of import duty from Israel, access to its commodity market and in expansion of the list of Ukrainian products exported to this country. **Conclusions.** Ukrainian-Israeli cooperation in agrarian sphere should not be limited only to trading operations. The success of Israel in much is linked to long-term researches in the field of agrotechnical innovations. Acquaintance to these techniques, their implementation in agroindustrial production, as well as engaging Israeli investments will significantly reform agricultural sector of our country. It is obvious, that combination of opportunities of Ukraine and Israel will allow accumulating essentially agroindustrial potential, strengthening positions of our countries in the world market of agricultural products.

Key words: *Israel, relations, agriculture, coope-ration, newest techniques.*

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Israel has made significant progress in the development of its agro-industrial complex. Despite to the fact that geography of Israel is not optimal for farming, now the country is a major exporter of fresh products and the world leader in the field of modern agricultural technologies. More than half of the country's area is a desert. The climate and the lack of water are not favorable for the farming. Such natural conditions along with unfavorable external social and political factors stimulated the need for the rapid development of intensive agriculture based on the latest technologies (color illustrations on Cover page 4).

Historically, even before the creation of the State Israel in 1948, the idea of agrarian economy development dominated in the Jewish population of Palestine. Although Israel is not the agrarian country, for several decades special attention in the strategy of the economic development has been given to the agriculture. Only in the last two a decades, rapid formation of the post-industrial economy in the country has destitute the agrarian sphere of its priority. Decrease of the share of the agrarian sector was accompanied by a significant increase in agricultural production, its intensification, deepening of its export specialization.

Agriculture of Israel is predominantly built on the principle of common social

formations, which were formed at the beginning of the twentieth century. Kibutzes (from the word "group" in Hebrew) are the largest such formations in which members jointly own means of production

and share economic, social and cultural achievements depending on their needs. First kibbutz "Degania" was founded by the Jewish settlers in 1910, for 38 years before the state of Israel came to light. Jewish immigrants at best had a poor idea of agriculture: because in Russia and in other countries of Eastern Europe, where the first Zionist settlers came from, Jews were generally not allowed to own the land. The firm principle of Zionist ideology was that Jews would not achieve sovereignty until they learn to work on the land. Among the settlers, there were many socialists, who opposed private farming in favor of joint ownership of land, its common cultivation and, in general, life in the commune [2]. It was in the Israeli kibbutz that in practice [1] a slightly modified communist principle "from each according to the abilities, for each according to the needs according to the level of development of the collective household" was implemented.

The second kind of such formations are moshavs, which are built on the principle of family farms, united in a single community, where land plot owners are jointly involved in the common production and the sale of manufactured products.

Currently, kibbutz and moshavs produce 80% of agricultural production in the country [2].

It should be noted that for the last few decade, this structure has changed significantly, mainly, in favor of modern agroindustrial complexes and a withdrawal from the traditional equitable distribution of economic gains. Currently, Israel's Kibbutzes no longer obtain largest income from agricultural production, but from other types of activities. It is also noted intense shift from common to private property.

With only 20% of Israel's land in natural conditions suitable for farming, agricultural products stands 1.3% of the country's GDP and 4.2% - in export of goods. It is interesting that nearly 2.9 billion $ (or 2.2% of total exports of goods and services) is an export of agricultural technologies, scientific agricultural researches and services. With only 2% of Israel's labor force (about 65 thousand workers) employed in the agroindustrial complex, Israel covers 95% of its own needs in agricultural products by importing only grain, oilseeds, meat, coffee, cocoa and sugar. It is believed that agriculture only then is effective and highly productive, if one farmer produces foodstuffs, necessary for the life of 30 - 50 people. In Israel one agricultural producer feeds 115 citizens, in the USA - 75, in Ukraine now one farmer feeds about 15 people [2].

After Israel achieved independence in 1948, the total area of cultivated lands increased by 2.6 times and stands now for about 450,000 hectares, and the irrigated area increased by 8 times, reaching for 254,000 hectares. During the same period, the number of agricultural settlements has increased from 400 to 900.

From the 450000 hectares of agricultural land, 58% is reserved for the cultivation of vegetables, fruits and other crops, 19% - citrus fruits, 23% are used for growing flowers, fish farms, etc., 130,000 hectares are used as cattle pasture.

In accordance with "Land Law" in Israel, all lands are divided into privately owned and public. More than 90% of all lands in the country are owned by the state. The private sector includes land in the settlements sold by the state in private ownership to the citizens and commercial companies for the construction of houses and commercial facilities. Israel has created an electronic database (Land Registry), in which all owners, tenants and land users are registered. Any actions related to the transfer of ownership, lease and use of land, become legally valid only if there is a record in the Land Register.

In accordance with current practice, land plots are provided by the state for long-term use (49 years) with further prolongation on a paid basis. The cost of renting a land plot depends on the location and plot assignment.

The most advanced technologies are being widespread introduced in Israel's agriculture. The limited natural resources are used very effectively. All-Israel water pipeline, supplies water from the north of the country (mainly from Kineret Lake) to arid southern regions, deserts are irrigated. The main agricultural crops are: grains, vegetables (tomatoes, zucchini, cucumbers, peppers), fruits (apples, peaches, cherries, bananas, dates, melons, watermelons, citrus fruits, mangoes, avocados, kiwi), cotton and flowers.

In recent years, more and more attention has been paid to the environmental aspects of agriculture - the reduction of the use of chemicals for pests protection and a wider application of alternative means and methods, environmentally friendly processing of agricultural waste, etc.

Besides the Jewish sector, there are Arabic farms located in the territory of Israel and their main direction of activity is the growing of vegetables, fruits and livestock (sheep and goats).

Farmers in Israel enjoy extraordinary respect, which is primarily due to their pioneering role in the formation and development of a young state. Kibutz existed even before Israel has appeared. The state gives to kibbutzes and farmers massive and multilevel support: provides government loans at 10% per annum for 20 years, issues quotas and compensate 2/3 of the cost of water.

The Shaham (Instruction) Service of the Ministry of Agriculture and Rural Development provides valuable assistance. Every farmer has the right for 100 hours of consultations on technology and economy: 70% of the cost of these consultations are paid by the state and 30% by farmers themselves. Various methods of instruction are used: individual consultations, one-day seminars, courses, seasonal meetings, telephone consultations, computer analysis, etc.

Israel has developed a system for stimulating the introduction of new technologies and innovations. The state subsidizes farmers up to 40% of the cost of buying and introducing new technologies. The farmer who built the modern greenhouse (its cost can be round $ 500,000) and put it into operation, receives as a gift from the state 30% of its value (he will pay a third of the loan). In agricultural production, the marketing approach prevails; it is subordinated to the entire post-harvesting system: sorting, gas processing, packaging, cooling, etc. The results of such a policy are the annual increase in agricultural production up to 10%, and increase 2.5 times of the volume of production over the past 10 years.

The secret of the success of Israeli agriculture lies in close co-operation between farmers and scientists in the development and implementation of advanced methods in all spheres of agriculture, as well as in the use of technical innovations, modern irrigation technology and the latest agricultural equipment. Widely known are the achievements of Israeli in genetics and biotechnology - for example, there are zucchinis in the form of a saucer, black watermelon, red banana, green and brown cotton.

Almost everywhere in Israel, agriculture is associated with irrigation systems. However, conventional sprinklers are rarely used, for example, when wastewater is disposed of. In contrast, almost everywhere you can see thin black hoses of dripping irrigation: on banana, date and grape plantations, in the cultivation of vegetables and flowers, and even on greened roadside stripes. Thanks to this technology, the reduction of water losses by 20% is achieved and with automated control - even more. Israeli scientists and engineers, in close cooperation with farmers have reached leadership in this area around the world. Technology of dripping irrigation has recently been marked as the most important discovery of Israel since the founding of the state.

Israel's aquaculture constitutes 2.9% of all agricultural production. For the needs of this industry, about 100 million cubic meters of water are used annually. Today, the annual needs of the Israeli domestic market in these products are 11.4 kg of consumption per capita.

The production of fish reaches up to 0.5 kg per 1 m3 of water in open ponds and up to 20 kg per 1 m3 of water in closed rates. It should be noted that farms, which apply a system of biofiltration in the closed rates, reach the level of production of 60 kg of fish per 1 m3 of water.

Taking into the consideration the lack of water, many fish farms are located on the coast of the Mediterranean and the Red Sea for cultivation marine species through the circulation of water from the sea to the rate and vice versa. Production in such farms increased from 900 tons in the 90’s of the last century to 3000 tons in our days.

The success of Israel in the field of aquaculture is clearly demonstrated by the fact that Israel is now the third largest exporter of sturgeon caviar in the world. In addition to fish for food, widespread development has received the direction of cultivating decorative, exotic fish, with annual turnover of trade about 8 million $.

Cooperation between Ukraine and Israel in the agro-industrial sector is developing successfully. Already, Israel is among the top 20 countries with which Ukraine has the largest trade in agricultural

products (ranked 15th), ranked 11th in exports, and 61st in imports. Israel's share in agricultural exports is 2.7%, while in imports it is 0.2%.

In 2017, trade in agricultural products between Ukraine and Israel amounted to 411.2 million $. The main agricultural export commodity groups from Ukraine to Israel in 2017 were: grain crops - 281.2 million $ (46.5% of total exports, growth by 59.8%); seeds and fruits of oilseeds - 48 million $ (7.9% of total exports, growth by 47.9%); residues and wastes of the food industry - by $ 29.1 million $ (4.8% of total exports, falling by 36%); fats and oils of animal or vegetable origin - $ 9.9 million $ (1.6% of total exports, an increase of 65.4%); milk and dairy products, poultry eggs; natural honey - by 8.9 million $ (1.5% of total exports, an increase of 196.7%); sugar and sugar confectionery - 8.7 million $ (1.4% of total exports, an increase of 11.8%); products of the flour-grinding industry - by 7.3 million $ (1.2% of total exports, falling by 11.1%). The above information was calculated according to data of the State Statistics Committee of Ukraine [3].

Israel, in its turn, supplies to Ukraine substantially less agricultural production products for only $ 9.2 million $. The structure of Israeli exports of agricultural products to Ukraine in 2017 was as follows: fruits, nuts and zest - 3.4 million $ (2% of total exports, growth by 47.9%); various food products - 2 million $ (1.2% of total exports, growth by 25.9%); vegetables, plants and root crops - 1.2 million $ (0.7% of total exports, falling by 1%); vegetable processed products - 1.2 million $ (0.7% of total exports, an increase of 27.1%) [3].

Only in the past few years, there have been two meetings of the ministers of agriculture of Ukraine and Israel, visits of the Deputy Minister of Agrarian Policy and Food of Ukraine, 5 representative business forums on agrarian subjects. Almost 120 Ukrainian businessmen organized visits to Israel in order to get acquainted with the Israeli experience in agriculture.

Ukrainian experts were interested in the latest technologies of increasing milk production, the modern irrigation systems, the introduction of computer technologies in the management of agricultural processes, improving the processing and storage of cultivated products etc. In their turn, their Israeli counterparts familiarized themselves with the agro-industrial potential of Ukraine, the prospects of investment in Ukrainian agriculture.

A significant potential has the cooperation between the National Academy of Agrarian Sciences of Ukraine and research centers of Israel in the agrarian sector, in particular, with the research center "Volcani" under the auspices of the Ministry of Agriculture and Rural Development of the State of Israel.

Over the past years, Ukrainian experts have participated in multi-sectoral research programs organized by the Israeli side. Particularly noteworthy is the cooperation with the Center for the Development of International Cooperation of the Ministry of Foreign Affairs of Israel "MASHAV". The center actively cooperates with Ukrainian organizations, experts and scholars in the field of agricultural studies, conducts regular consultations and advanced training courses for Ukrainian agrarians.

An interesting form of multilateral (Ukraine-Canada-Israel) cooperation in the field of agriculture within the framework of technical assistance projects is the Ukrainian fruit and vegetable business project (Ukraine Horticulture Business Development Project (UHBDP) [4], which aims to help Ukrainian farmers to grow fruit and vegetable products by enhancing their potential as producers and finding high-performing markets for them. The project works in the southern regions of Ukraine (Zaporizhia, Kherson, Mykolaiv and Odessa) and is intended to support 30,000 small/medium-sized farmers and small producers of fruits and vegetables.

It is expected that small farmers, with the assistance of UHBDP, will collectively expand their sales to 50,000 metric tons of fruit and vegetable products worth 40 million $ a year until the end of the project. The funds for this project (nearly 20 million Canadian dollars) were allocated by the Ministry of Foreign Affairs, Trade and Development of Canada (DFATD) and the Mennonite Economic Development Association (MEDA). The partner in the implementation of the project is the Center for the Development of International Cooperation of the Ministry of Foreign Affairs of Israel "MASHAV". The grant assistance of this project is aimed at conducting training, providing equipment, as well as practical and methodological

assistance in establishing more efficient agriculture for farmers and household owners (with the involvement of Israeli and Canadian specialists).

To support small and medium-sized farmers, a credit mechanism was created to facilitate access to finance so that farmers can invest in their business development. Local agricultural institutions will be assisted in developing new courses on and environmentally sustainable management of small farms for the development of fruit and vegetable production. A similar project in the past gave the 3 dollars of income on 1 invested dollar.

Results. Israel is one of the world leaders in innovative rural development. In turn, Ukraine, with its significant natural potential, is now among the world leaders in agricultural production, in particular, in the production of grain, sunflower and sunflower oil, poultry, and other agricultural products.

Significantly intensify our cooperation in the agrarian sector will help signing of the Free Trade Area Agreement between Ukraine and Israel, preparation of which is now at the final stage.

The liberalization of the trade regime between our countries will ensure the diversification of Ukrainian exports. Considering that Israel has traditionally been a net importer of Ukrainian agricultural products, including wheat, feed crops, sugar, and oilseeds, there is interest in the maximum reduction of Israeli import duty rates, access to its market and the increase of the list of Ukrainian products that are exported to this country.

Conclusions

Ukrainian-Israeli cooperation in agrarian sphere should not be limited only to trading operations. The success of Israel in much is linked to long-term researches in the field of agrotechnical innovations. Acquaintance to these techniques, their implementation in agroindustrial production, as well as engaging Israeli investments will significantly reform agricultural sector of our country. It is obvious, that combination of opportunities of Ukraine and Israel will allow accumulating essentially agroindustrial potential, strengthening positions of our countries in the world market of agricultural products.

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