Researching – Surviving: Agricultural Experimentation in Ukraine under German Occupation during the Second World War

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Abstract: Exploiting Ukrainian agriculture was crucial for the German geostrategic and military plans and it was pursued on a large scale, from confiscating raw materials to enhancing the scientific support of the industry. On the threshold of the Second World War, 137 Ukrainian research institutions carried out agricultural research funded with 17 million rubles per year. The lack of elaborate evacuation plans and the rapid advance of the *Wehrmacht* led to the failure of the Soviet evacuation campaign in 1941. The full-fledged evacuation was also impossible for objective reasons: for agrarian scientists, both the object and the result of their research hardly exist but on the land. Agricultural scientists who found themselves under the occupation of the German authorities tried to save from plunder and destruction the technical apparatus, the scientific documentation, and the breeding materials. Given the importance of agricultural research facilities for German food security, Ukrainian agricultural research institutions came under the jurisdiction of the German administrative structures (the *Reichsministerium* for the Occupied Eastern Territories). Ukrainian agricultural scientists remained in the occupied territories, where the occupants enforced compulsory military service. Thus, they were forced to work for the "new masters", participate in the export of the intellectual product to Germany, and provide assistance in scientific projects of the German military. The less appalling scenario for those scientists implied the continuity of the research pursued before the war, combined with the attempt to preserve the scientific results, and avoid starvation or deportation to Germany.

Keywords: *Second World War*, *Eastern front 1941-1945*, *German occupation of the Soviet Union*, *Ukrainian agriculture and agrarian science*, *History of science*,

The realities of the existence of a democratic Ukraine, which suffered military aggression, annexation and occupation of a certain part of its territory by the Russian Federation, actualize the study of the problem of preserving and restoring the research process for the needs of Ukrainian society. The historical experience of Ukrainian agricultural research in the period 1939–1945 is extremely important in this context. It makes it possible to analyse the issues of material and human losses, robbery, social, and ethical conflicts in the scientific sphere, as well as the interaction of scientists of the warring parties. In the extreme conditions of military confrontation, changes in the system of power, ideology and political system, devastation, significant movements of material

funds and population, and irreparable human losses, the Ukrainian agrarian scientific community faced the task of self-preservation and preservation of the scientific product. This period vividly illustrates how the strategic importance of scientific support of agriculture during the military conflict has increased, with each of the warring parties trying to make the most of the scientific potential of Ukraine in order to establish food security for each respective side. Ukrainian science is facing this same issue in the current military conflict.

Under the concept of agricultural research, we understand a comprehensive study in specialized research institutions of agronomic, zootechnical and other agricultural phenomena carried out in natural and specially created conditions using appropriate methods and tools. The method of activity of such institutions is to work out the most effective ways to improve the cultural level of agriculture. In the conditions of military conflicts, agricultural research faces particularly unfavourable conditions, more than any other branch of knowledge. After all, an agricultural scientist has a specific object of research, which directly depends on local soil and climatic conditions, so the scientist's research cannot exist in isolation from a specific territory. In addition, most agrarian research processes are concentrated on experimental fields, gardens and farms, which are located not in scientific centres, but rural areas. In most cases, an agricultural scientist has a living scientific product – a plant or an animal. All this creates additional difficulties regarding its movement, export, or preservation.

1. Preparing for the "expansion of vital space"

At the time the National Socialists came to power in Germany, German society as a whole was still suffering from food shortages of the First World War, when there was a sharp drop in food production and famine. This was considered one of the main reasons for their defeat. It was only in the mid-1920s that the pre-war level of agricultural production was reached and the industry was restored (Klemm 1992, 333). Along with the problem of redistribution of land resources to compensate for the territories lost after the war, the Nazis were also focused on analysing the food collapse during WWI, so that German agriculture would be better prepared for the future conflict. The idea was not only to increase productivity in agriculture, but to develop ways of maximum self-sufficiency in agricultural products, the so-called autarky policy. Their first goal was to make Germany's food industry self-sufficient by at least 95% and thus reduce its dependence on imports (Arnold 2005, 90).

During the Nazi period, agricultural research in Germany that aimed at

achieving independence from food imports received unprecedented state support and funding within the framework of the most prestigious scientific organizations of the country: the Kaiser Wilhelm Society (*Kaiser-Wilhelm-Gesellschaft*, KWG), the German Research Foundation (*Deutsche Forschungsgemeinschaft*), and and government ministries for food and agriculture, education and science, regional planning, and research Herbert Backe developed the concept of "freedom of food" which was based on the principles of autarky and food distribution. He was the Secretary General of the Ministry of Food and Agriculture under Richard Darré, and later succeeded Darré as Minister. Having a significant influence in the scientific circles of Germany (Senator from 1937, and First Vice-President of the KWG in 1941), Backe insisted on expanding the areas of scientific work in existing research institutions of agrarian direction and initiated the creation of new institutions (Heim 2001, 8).

The methodological coordination of all sectorial research programs conducted by 1,200 sectorial research institutions subordinated to various departments was carried out by the Research Service (*Forschungsdienst*, FD), established in 1935 and headed by Professor of Agronomy at the University of Berlin, SS *Oberführer* Konrad Meyer-Hetling. However, according to Hitler, as summarized by historian Timothy Snyder, science could not solve the problem of food supply in Germany, because there was a lack of land resources (Snyder 2017, 25).

The purpose of expansion to the east of Europe (concept: "eastern space" – *Ostraum*) was to create a habitat for the German race, while the local population was to be displaced, enslaved, and destroyed. And in this concept, agricultural sciences were assigned a specific role in the planned targeted research that would allow the exploitation of the territories captured east of Germany and, above all, in Ukraine, to meet the needs of the Third Reich in food and raw materials (Rössler 1993). The development of the agricultural potential of Ukrainian lands had to take place in all its dimensions. In practice, it looked like a study of soil and climatic features of these regions, the breeding of plants and animals adapted to these conditions, analysis of labour relations in agriculture, and consumer needs. Therefore, one of the tasks of German scientists was to become acquainted with the achievements of Soviet agricultural scientists. Of particular interest were the results of research in institutions located in the Ukrainian lands as a key agricultural region.

This study was facilitated by the general policy of rapprochement in the scientific sphere, which prevailed after the signing of the Non-Aggression Pact

between Germany and the Soviet Union on 23 August 1939. In March 1940, the Ministry of Science, Education and Public Education developed a special circular on the restoration of scientific contacts with the Soviet Union. The leaflet included a list of names of scientists by field who had to constantly review the achievements of Soviet science in their fields and inform their colleagues on their findings (Dafinger 2014, 89-95). An example of a direct study of the Soviet experience was the trip of a group of German scientists (J. Schmidt, T. Roemer, W. Gleisberg) to the All-Union Exhibition of National Economic Achievements (Moscow) in 1940. Soviet agricultural research was organised on a continental scale, and the scientists studied the challenges and solutions with Germany's plans for significant territorial expansion in mind (Heim 2006, 274-275). Also, surprising was the involvement of women in scientific research, which was extremely important during the war. But most important was the practical experience demonstrated by Soviet scientists. German scientists were stunned by the results of Soviet scientists on artificial insemination of agricultural grasses combined with hormone therapy, so it gave better results than their German colleagues. Breeding was also of particular interest. A special object of the competition was the collections of wild species of cereals and legumes, which were the source material for further breeding research. The Soviet Union frequently organised expeditions to collect plants on its own territory, and conducted experiments on growing plants in different soil and climatic conditions to study their characteristics and determine heredity and dependence on the environment.

2. From academicians to collective farmers. Agricultural research in the Ukrainian SSR

Ukrainian farmers could be proud of a functionally extensive network of agricultural research institutions. On the eve of the Second World War, agricultural research in the Ukrainian SSR was represented by sectorial research institutions that functioned in 16 of the 21 regions of the republic. As of April 1941, there were 137 institutions with funding of more than 17 million roubles per year, a significant increase compared to previous years due to the accession of agrochemical laboratories of motor-tractor stations to the research network of the People's Commissariat of Agriculture of the Ukrainian SSR.[1] However, agrarian research institutions, which functioned on the territory of Ukrainian lands, did not have a proper unified coordination centre and were scientifically and methodologically disparate. In 1935, after the high-profile arrests of academicians of the Ukrainian Academy of Agricultural Sciences (Kharkov), the

institution was liquidated. Only four research institutions in the Ukrainian SSR were subordinated to the central scientific coordination centre of agricultural science of the USSR – the All-Union Academy of Agricultural Sciences named after Vladimir Lenin (VASKhNIL, Moscow). Its competence also included the implementation of scientific support for national agricultural development programs throughout the country. Most of the 97 institutions (10 research institutes, 28 experimental stations, 16 experimental fields, 43 support points located in collective farms of the Ukrainian SSR and the Central Agricultural Library) were subordinated to the relevant republican ministry – the People's Commissariat of Agriculture of the Ukrainian SSR, which corresponded to the popular principle of merging science with practice. However, the structural unit of this ministry – the Sector of Research Institutions – actually controlled only financial and personnel issues, without interfering in the planning of research work. On the territory of the Ukrainian SSR, there were also agricultural research institutions that were subordinated to other ministries, usually of the all-Union scale – the People's Commissariat of Agriculture of the USSR, the People's Commissariat of State Farms of the USSR. For example, the People's Commissariat of the Food Industry of the USSR controlled the All-Union Institute of Sugar Industry, five research stations and two support points.

At the same time, the fundamental problems of Ukrainian agrarian science were also studied in the system of the Academy of Sciences of the USSR in the Department of Biological Sciences in the institutes of botany and zoobiology. The outbreak of the Second World War intensified its activities, within which specialized teams of scientists were formed to coordinate complex interdisciplinary scientific research: the study of pests and diseases of agricultural plants and animals, soil erosion, research of production capabilities of the western Ukrainian region, annexed to the USSR in 1939.

Such organizational dispersion did not allow to effectively solve the problems of agriculture of the republic, using all available scientific resources. On the other hand, the Ukrainian agricultural science, being decentralized in the conditions of centralization of science, fell into the status of secondary, inferior, and applied. This easily fitted into the format of a unique phenomenon that was introduced in the Soviet Union – collective farm research.[2] Professing the same principle of merging science with practice, house-laboratories were organised at collective farms as production associations, where the results proposed by scientists were checked by collective farmers. The emergence of such an organizational structure of agricultural research was due to the transition of the state in the late 1920s to collective farming and was to become an alternative to the branch academy of sciences. Academician and later

President of VASKhNIL, Trofim Denisovich Lysenko was an active advocate of house-laboratories. The success of the work of research institutions was measured by whether they could organise a broad verification of their scientific findings through these house-laboratories, and assist in organizing and setting up experiments and observations in collective farm production. With such an organization of the research process, the status of the collective farmer was higher than the status of the scientist. Often the further fate of not only the research, but also the team of scientists depended on the conclusions of the collective farmer. In case of the ineffectiveness of the experiments, scientists could easily be accused of sabotage and anti-Soviet activities. The end of the 1930s was marked by high-profile trials of entire scientific teams. Especially active was the so-called purge of personnel in breeding institutions. During these years, the methods proposed by Lysenko, who rejected classical genetics, were actively implemented. Those who opposed were fired, persecuted or even arrested. As a result, experienced and specialized employees were replaced by people who mostly came to science from production and had only a few years of scientific experience. This is confirmed by the figures presented in the report of the Agricultural Department of the Central Committee of the Communist Party of the Bolsheviks of Ukraine (CP(b)U), conducted in 1937 on the development of breeding in Ukraine. Of the 265 young specialists in the network of research institutions of the People's Commissariat of Agriculture of the Ukrainian SSR, a quarter of the workers had some scientific experience of up to 2 years, more than 60% had up to 6 years of experience. And only 12% had more than 10 years of scientific experience. The "public" opinion continued to be imposed that agricultural scientists who were educated and formulated during the empire were either unable to carry out the programs of "socialist reconstruction of agriculture" or were "counter-revolutionaries", "pests", and "lone wolves". And as Bolshevik propaganda convinced, they were one of the main factors that hindered the breakthrough of the industry. As the head of the Agricultural Department of the Central Committee of CP(b)U, Zynoviy Yosypovych Sidersky, noted: "Despite the industrial cleansing, the composition of scientific workers is littered with class-hostile people."[3]

The scientific community was becoming more and more a nomenclatural state of society; all stages of entry into it – from admission to postgraduate studies to higher positions – were under the control of party bodies. According to the recommendations submitted by VASKhNIL, "When selecting candidates for postgraduate studies, it is necessary to pay attention to the selection of socially acceptable and the most stable comrades in the party attitude, capable of research work."[4] In the period from 1934 to 1941, the number of postgraduate

students in the country increased by 3.5 times (from 268 to 926 people), and in 1936 there were 236 doctoral students. According to system of the People's Commissariat of Agriculture of the Ukrainian SSR, 60 to 80 people annually enrolled in graduate schools.[5] This trend was in line with the goals that stood for science in general – "rejuvenation of personnel". However, the results of this attempted modernization of agricultural science using forced personnel were weak. According to the report on the work of the Ukrainian Research Institute of Forestry and Agroforestry in 1937, only 3 out of the 60 postgraduate students who were at the institute during the 1930s, defended their dissertations, which led to professors being accused of sabotage.[6] A similar situation can be traced in other research institutes.

Thus, agricultural research has become an integral element of the state, with all its advantages and disadvantages. Having received priority funding, the agricultural research community had to come to terms with the rigid ideological and administrative dictates. At the same time, the de-indoctrination of science ultimately posed a threat to the state itself, whose incompatibility with science and the archaic nature of totalitarian governance was becoming increasingly apparent.

3. Change of owners

3.1 Evacuation of agricultural research institutions: a problem without a solution

The Soviet Union, preparing for an offensive war, did not have any evacuation plans developed in advance at the ministerial level in case of a large-scale war on the territory of the USSR (Pastushenko 2011, 495). This explains why this process in some regions of the country, especially in Western Ukraine and the Right Bank, was spontaneous. According to the Decree of the Central Committee of the Communist Party of the Bolsheviks of the Soviet Union (CPSU (b) of 27 June 1941, the property of the most important industrial enterprises, raw materials and food, and other valuables of national importance were subject to priority evacuation. The people were first considered only on 5 July 1941, when the Resolution of the Council of People's Commissars of the USSR developed the procedure for evacuation of the population in wartime. However, it was determined that the priority was the export of machinery, equipment and raw materials, so the priority evacuation was subject to specialists who accompanied the cargo. The largest volumes of material values were planned to be exported from Ukraine, so the leadership of the Ukrainian SSR created the Governmental Commission on Evacuation headed by Dmytro

Zhyla, Deputy Chairman of the Council of People's Commissars of the Ukrainian SSR. Only on 30 July 1941, the mobilization plan for the development of the national economy was adopted, which required constant adjustment due to the disappointing military situation (496). In Ukraine, the first mass evacuation campaign lasted about four months – from June to mid-October 1941, because by November German troops had already occupied a large part of the Ukrainian SSR. The second wave, which began in May 1942, was much smaller and covered only the Voroshilovgrad region.

The conditions at the beginning of the war dictated the need for urgent evacuation to the rear areas of scientific institutions. One of the first decisions of the Evacuation Commission concerned the institutions of the Academy of Sciences of the USSR, adopted on 29 June 1941. On 3–7 July, the list of academicians and corresponding members and scientists of physical, chemical and mathematical sciences was approved. The main location of the evacuated academic property and staff was established in Ufa.[7] But only part of the scientists and property of the institutions could be relocated to the rear areas of the Soviet Union.

Particular emphasis on the importance of evacuating the property of all agricultural institutions was made in the resolution of the Council of People's Commissars of the USSR and the Central Committee of the CPSU(b) on 17 November 1941 regarding the plan of agricultural work, which stated:

> In the conditions of the Patriotic War against German fascism, the temporary loss of a number of agricultural areas, especially important in providing the country with food and agricultural raw materials is the further expansion of sown areas and increase in yields of grain, industrial, vegetable crops and potatoes, especially in the Volga region, the Urals, Siberia, Central Asia. (*Ukrayins'ka RSR* 1967, 168)

Agricultural research institutions of the Ukrainian SSR had to contribute to this by deploying activities in the new natural and climatic conditions, joining the development of specialists in these areas. The rapid advance of the German army through the territory of the Ukrainian SSR prevented the organization of this process in the western and right-bank regions, largely in the southern regions of the republic. The evacuation of agricultural institutions from Kyiv and the Left Bank regions was more organised. The Soviet side partially evacuated only laboratory equipment and personnel of seven agricultural institutes and eight research stations. The property that could not be evacuated to the rear in accordance with the resolutions of the Council of People's

Commissars of the USSR and the Central Committee of the CPSU (b) of 27, 29,and 30 June 1941 was subject to destruction (Pastushenko 2011, 502). Some stations, their documentation and equipment, and crops were deliberately destroyed by the Soviet administration, implementing "scorched earth" tactics. The main executors of the Soviet authorities' directives on the destruction of property were the state security agencies. One particularly damaging act occurred in the Kyiv and Poltava regions: The Supoj river reclamation system had been cared about by Supoj's operational and reclamation department, and scientific support came from the Panfilo-Yahotyn stronghold, which was part of the institutional network of the Ukrainian Research Institute of Hydraulic Engineering and Land Reclamation. Over the course of three weeks, the People's Commissariat of Internal Affairs (NKVD) flooded the marshes, swamps, surrounding land, and crop fields with water from two reservoirs, over 20 million cubic meters of water. The drainage reclamation network, the result of many years of work by reclamation scientists, was destroyed. (Dovhoruk 2018).

The situation at the front led to a multi-stage evacuation of agricultural research institutions, due to which a significant part of the valuable scientific property was lost on the way. The route for most institutions was Kharkov, then Voronezh and later Saratov regions of the Russian Soviet Federative Socialist Republic. Agricultural research institutions that were of all-Union importance were relocated to the bases of research institutions that were part of their network or with which they had close scientific and production contacts. In wartime, when the redeployment was spontaneous, a certain part of the research institutions was dispersed among different institutions, which prevented them from developing the research process properly. Under such conditions, the geography of agricultural research institutions of the Ukrainian SSR was outlined by the regions of the Volga, Urals, Siberia and Central Asia, which corresponded to the goals of the USSR government to attract the scientific potential of agricultural research institutions of the Ukrainian SSR to intensify the industry of the rear regions of the Soviet Union (figure 1).

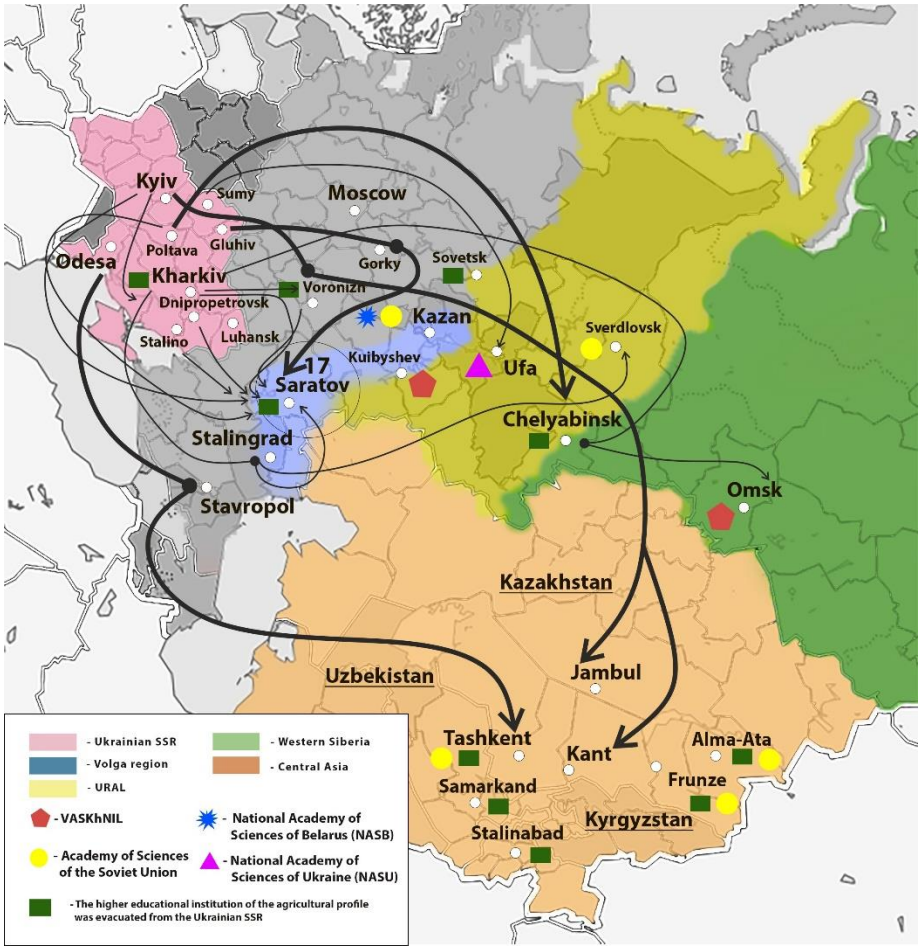

Figure 1: Map-scheme of relocation paths of Ukrainian agricultural research and educational institutions during the Second World War

3.2 Taking control

Due to the importance of agricultural research facilities for Germany's food security, these institutions were under the special control of the Imperial Ministry of the Occupied Eastern Territories (*Reichsministerium für die besetzten Ostgebiete*, *RMfdbO*), which was formally responsible for the administration of the occupied eastern territories. The ministry oversaw the Central Service for the Research of the East (*Zentrale für Ostforschung des Reichsministeriums für die besetzten Ostgebiete*), Alfred Rosenberg's Operational Headquarters (*Einsatzstab Reichsministeriums für die besetzten Ostgebiete*). These offices conducted surveys of research institutions in the occupied territories, seized valuable scientific property, coordinated business trips of German scientists and specialists to these territories, developed projects to reorganise agricultural research in the occupied territories for the needs of Germany.

On the territory of the *Reichskommissariat Ukraine*, coordination centres for agricultural research were organised and took control of all agricultural research institutions. Beginning in September 1941, the Centre for Agricultural and Forestry Research for North-western Ukraine (*Landwirtschaftlich Forschungszentrale für die Nordwest Ukraine*), or its abbreviated name – the Centre for Agricultural Research (*Landwirtschaftliche Forschungszentrale*), began to operate in Kyiv at the *Reichskommissariat Ukraine* under the leadership of the Rector of the Institute of Animal Husbandry and Dairy Farming at the University of Göttingen, Professor Dr Otto Sommer (*Sil's'ke hospodarstvo URSR* 2012, 77-78). In order to control the scientific life of the southern region of Ukraine, the Research Centre of South Ukraine (*Forschungszentrale Süd Ukraine*) began to operate in September 1941. Due to the fact that the city of Odesa, the largest scientific hub of southern Ukraine, was part of the Governorate of Transnistria and was subordinated to the Romanian authorities, the centre of coordination of scientific research in the southern region of Ukraine became the city of Kherson, which also had powerful resources for the development of scientific work for the needs of agriculture. Before the war, the Kherson Agricultural Institute functioned here, and the Cotton Research Station with a powerful scientific base was located near the city. The centre was headed by Professor Dr Eduard von Boguslawski, who was the head of the experimental farm in Wroclaw-Güntherbrücke, *Versuchswirtschaft* (Piegler 1940, 153).

In their analysis of the scientific institutions of agrarian direction, German experts noted the scale of Soviet agricultural science. However, they also observed that the institutions were fragmented and did not have a properly unified scientific and methodological centre that would manage and direct all the work of the network according to a certain plan. Methodological isolation within each institution led to the duplication of topics. In particular, in his final report, the head of the Science group of Rosenberg's Operational Headquarters, Wolfgang von Franke, argued that "the basic Bolshevik principle was to fragment scientific work in a large number of institutes that developed related and similar tasks. [...] There are some that are essentially just laboratories or workshops, without scientific significance."[8] Therefore, the main working issue was the reorganization of science in the direction of uniting institutions for more applied research. According to the report of the Central Service for Oriental Research, this institution was tasked with "making Oriental research potential available for German research to strengthen and improve the Reich's military economic power."[9]

First of all, the occupiers aimed to use the potential of the institutes of the Academy of Sciences of the Ukrainian SSR as efficiently as possible. Already in

his report, von Franke pointed out that the institutes of the Academy of Sciences of the natural cycle (Institutes of Biology and Zoology) should continue to exist. The project of reorganization of these academic institutions into applied research institutions was developed by Professor Dr W. Gleisberg.[10] The Institute of Agricultural Botany (*Institutes für Landwirtschaftliche Botanik*) was established on the basis of the Institute of Botany of the Academy of Sciences of the USSR. The Institute of Plant Protection (*Landesanstalt für Pflanzenkrankheiten und Pflanzenschutz*), which was sometimes called the Central Plant Protection Station (*Zentralanstalt für Pflanzenschutz*), was created by combining non-evacuated scientists and employees of the Institute of Zoology of the Academy of Sciences, the Pest Control Department of the Institute of Sugar Industry of the People's Commissariat of Agriculture of the USSR.

Officially, the first stage of the reorganization of agrarian science began on 6 June 1942 by creating a single centre to ensure and unify economic and local history research in Ukraine. In order to achieve this goal and to provide scientifically sound information to the services of the Reichskommissariat Ukraine, the Institute of Regional Studies and Economic Research (*Institut für Landeskunde und Wirtschaftsforschung*) was established (Professor Dr von Grünberg in Rivne was appointed as curator, and Dr M. Rosenberg, Advisor to the State Administration, in Kyiv, was appointed as executive director) (*Nimets'ki vcheni* 1942).

According to the recommendations of this Institute, control over the crop sector, especially with regard to breeding research, was the first task that needed to be established. Already on 19 August 1942, the Imperial Ministry of the Occupied Eastern Territories issued a "Circular on objects in the field of agriculture and crop production" (*Runderlaß über Einrichtungen auf dem Gebiet des Acker- und Pflanzenbaues*), according to which the Ministry determined a special status for all research institutions of the regional level (research stations, laboratories, experimental fields, seed control stations), which would provide surveys, productivity tests, and phytosanitary measures in agriculture. The task was to consolidate all existing and surviving former Soviet research institutions.

The next step took place on 30 September 1942, when the circular of the *Reichskommissar* for Ukraine, Erich Koch, clearly spelt out the subordination of all research institutes and institutions that were defined as "regional" (*Landes Institute*). The scientific support of all regional institutes was carried out by the Department of Science and Culture (*Abteilung Wissenschaft und Kultur*). A German scientific curator had to be appointed at each institution. The procedure for their approval was determined – professional departments

submitted their proposals for candidates among with well-known German scientists, and the Department of Science and Culture approved them. In addition, the political and organizational management of the institutions was carried out by employees of professional departments, the so-called researchers-referent (*Forschungsreferent*), who were simultaneously subordinated to the Department of Science and Culture.[11] In real life, the Ukrainian administrative apparatus coordinated all actions with German curators and indeed only monitored the implementation of their orders.

Paul Körner was responsible for the organization of agricultural research (*Landesbauerführer*) in the *Reichskommissariat*. He was considered the right hand of G. Gernig, representing him in the General Council of the four-year plan, and he was also a member of the Presidium of the German Research Foundation (Neliba 2005, 57). On 13 October 1942, he drafted a decree on the establishment of the Regional Office for Agricultural Research and Training (*Landesamt für Landw. Forschungs- und Ausbildungswesen*). It was noted that the natural and economic features of agricultural production in Ukraine differ from those in Germany, so it was deemed necessary to conduct large-scale research on all issues related to agriculture, their evaluation, and transfer to production for the successful development of the agricultural potential of this region. The Regional Research Centre (*Landesforschugszentrale*), as the executive structure of the department, had to carry out the organizational and administrative unification of all regional research institutes. A subordination structure was created, according to which the Regional Research Centre would be overseen by both the Regional Office for Agricultural Research and Training and the Department of Nutrition and Agriculture (*Hauptabteilung Ernährung und Landwirtschaft*). In the opinion of the developer, this would guarantee that the results of the research work would be methodologically consistent and could also be implemented in practice.

The project was discussed at the meetings of the Ministry in February and March 1943. The main key positions were that the Centre should report on the planning of research work on the territory of Ukrainian lands, and subsequently report on their implementation to the Central Service for the Research of the East. This instruction also concerned the solution of personnel issues – all scientists who were under the jurisdiction of the Regional Research Centre were first approved by the Central Service for the Research of the East.[12]

This project was implemented with certain improvements and adopted by the *Reichskommissar* circular of 14 April 1943.[13] New in the document was a clear delineation general economic and agricultural research areas, whose specialists

were formed into committees. The heads of the committees were to be appointed from among the best German directors of research institutes in the occupied territories. In particular, the head of the latter was to report directly to the Department of Nutrition and Agriculture. To advise the Head of the Research Centre (*Präsidenten*), a Council was formed from two committees. The existence of the Branch Kherson ensured the activities of research institutions in the south of Ukraine. For the first time, the funding scheme was specified. The final registration took place on 25 August 1943, when *Reichskommissar* of Ukraine Koch signed the order "On the new procedure for conducting important research in scientific institutions of Ukraine". According to the new document, the Regional Research Centre of Ukraine would fall under the *Reichskommissar* of Ukraine (*Landesforschungszentrale Ukraine beim Reichskommissar für die Ukraine*) (hereinafter the Coordination Centre). It would be based in Kyiv and headed by the same Professor Sommer from the German side (*Istoriya Natsional'noyi* 2007, 624-625). The Centre controlled the scientific and political issues of all the research institutions that were overseen by the *Reichskommissariat*, and it was also a representative of the Central Service for the Research of the East.

Particular attention was paid to the agricultural direction; the conditions of war demanded rapid development of the agricultural potential of Ukrainian lands, which in turn required unified management in agricultural research. Therefore, a Special Group of Agricultural Research (*Sondergruppe landwirtschaftliche Forschung*) was created within the Regional Research Centre. Discussions continued on the status and subordination of the Research Centre of the South of Ukraine. This process was completed by the creation of the Kherson branch of the Special Group (*Nebenstelle Cherson der Landesforschugszentrale Ukraine – Sondergruppe landwirtschaftliche Forschung*), and Professor Yancke (624-625) was appointed the German curator.

Out of the nine research institutes subordinated to the Regional Research Centre, three regional institutes (veterinary research, agriculture and local lore, and forestry) represented agricultural topics. The Special Group included another 11 research institutes and ten stations, and the Kherson branch had five institutes (most of them are essentially branches of the central ones) and six stations.

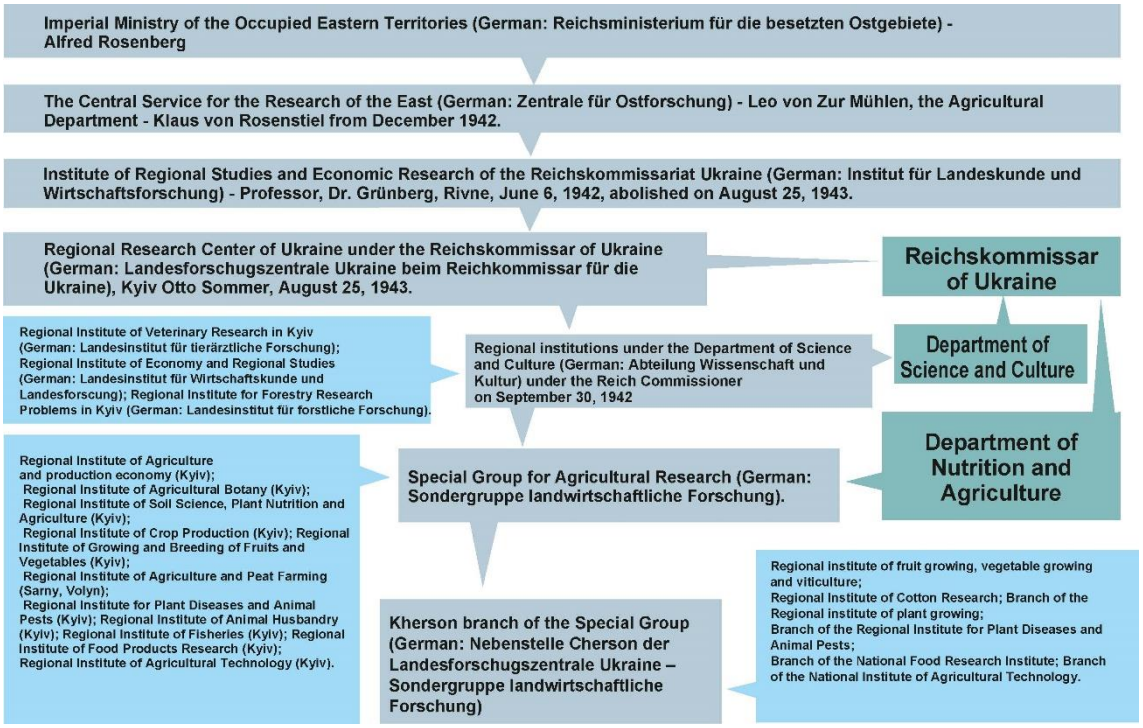

Figure 2: The final version of the agricultural research case management model on the territory of the *Reichskommissariat Ukraine*

The Regional Research Centre of Ukraine was financed from the budget of the *Reichskommissariat Ukraine* under Section VI "Science, upbringing and public education", but the Special Group and its branch in Kherson and all the institutions that were subordinated to them were provided under Section VII "Food and agriculture".[14] Thus, during 1942–1943 there was a permanent reorganization of agricultural research under the *Reichskommissariat Ukraine* with the goal of maximizing the scientific potential of agriculture on Ukrainian lands. But agricultural research in Ukraine was not integrated into the general German context, which once again confirms the colonial nature of the conquests.

3.3 The task for Ukrainian scientists: to save themselves and their research

A. Survival strategies

A significant number of agricultural scientists remained in the occupied territories. Approximately 243 scientists worked in agricultural research institutions of the *Reichskommissariat Ukraine*, which was almost half of the

entire scientific staff of the industry before the war. There were multiple reasons for this situation. First of all, only party members and their families, and administrative staff of institutions (who had to be party members) were subject to evacuation. Outstanding achievements in the scientific field were not reason enough for evacuation priority. Some were not evacuated for personal reasons: family circumstances (old and sick relatives), age, or health. Some deliberately avoided leaving. Others wanted to stay to protect the results of their own and collective scientific work from theft and destruction. There were also those who expected the arrival of a civilized nation and wanted to continue working on their research. Some dreamed of joining Western European scientific projects, which most scientists in the Soviet Union were deprived of. Yet others had experienced repression and persecution by the Soviet authorities against themselves, family members or friends, so they consciously wanted to work for another state.

The people who found themselves in the occupied territories faced the question of survival in the new socioeconomic and political conditions, and therefore interaction with the occupation authorities. Here it is important to determine the line between forced labour versus assisting the enemy in winning the war. After all, these scientists would all be accused of collaboration with the enemy when the Soviets returned to power. Their scientific careers would be suspended, they would be removed from scientific work, or they would be arrested and deprived of all scientific titles.

Compulsory labour duty was introduced in the occupied territories from the very first days (*Nimets'ko-fashyst·s'kyy okupatsiynyy rezhym* 1963, 27-29). Of course, the best scenario for intellectuals was to continue the activities they had been doing before the war. Official employment in research institutions helped scientists to survive in difficult wartime conditions. First of all, it guaranteed a stable financial income, and issuance of labour cards, which exempted them from forced labour in Germany.

Representatives of research institutions tried to interact with local authorities to prove the need to preserve scientific institutions in the occupied territories. Scientists were in constant contact with representatives of the Department of Culture and Education at the Kyiv City Administration. As a result, the composition of the Presidium of the Ukrainian Academy of Sciences was approved and 21 institutions were appointed acting directors.[15] In December 1941, the decision of the Kyiv City Council already stated that "given the political significance and economic effect of the work of academic institutions in the revival of industry and agriculture of Ukraine, it is inexpedient to bring any

of these institutions to a certain mothballing."[16]

In the draft resolution of the Kyiv City Council "On the reorganization of research institutions in Kyiv" of 29 December 1941, it was proposed to continue the work of 34 research institutions registered in the Department of Culture and Education with their further reorganization. However, according to the report of the *Generalkommissar* of Kyiv, Waldemar Magunia, on 5 January 1942, it was decided to liquidate the Academy. Only institutions with a technical and natural profile were considered useful by the German civil authorities, so they were transferred to the relevant departments of the *Reichskommissariat*.[17] The final decision to preserve such institutions and continue their scientific work was made only on 15 January 1942, because, as noted, "there is a German interest in this."[18]

In the first months of occupation, when the further fate of agricultural research institutions was still being decided, the main task for scientists was to preserve the material and technical base, scientific documentation, and breeding materials from destruction or theft by local residents. In most scientific teams, a process of self-organization took place. In these cases scientists themselves initiated a meeting of the team, elected a head or official representative (in the absence of the previous director) responsible for the protection of the left property, and developed plans for operational activities to continue research work.[19]

Throughout the entire period of occupation, the issue of providing food and industrial goods of prime necessity was acute. According to the recollections of biologist Professor Heinrich Walter, who worked as a senior advisor to the Centre for Agricultural Research: "Many of the scientists looked extremely bad and were at the limit of their strength" (Val'ter 2006a, 32). To save the scientific staff from the effects of the war, the German leadership tried to improve the general standard of living of Ukrainian scientists. In addition to the products provided by ration cards, employees of the institutes received food at officially established, not the market prices that were several times higher and constantly growing. The problem of food supply was solved at the level of city authorities by organizing a canteen for scientists (*Yidal'nya* 1942). A fairly effective survival strategy for a scientist of an agricultural research institution was to work on experimental farms. A scientist could acquire a plot of land for growing agricultural plants and could work on Saturdays or Sundays at the expense of additional hours on other working days. The amount of sowing material that was allocated for these needs indicates the massiveness of this phenomenon among scientists.[20] Medical care, free transport, underwear, seasonal and

working clothes and shoes, soap and soda – all this was organised and allocated for the needs of scientists of research institutions of Kyiv, thus forcing people to stay in Kyiv and to keep working to survive the occupation.[21]

b. Undercover robbery

The next challenge for scientists was to preserve valuable scientific property from being exported to Germany. During the entire period of occupation, all agricultural research institutions in the occupied territories were subjected to a detailed inspection by German specialists. The primary inventory of the property, assessment of the condition of the buildings of these institutions, the content and composition of the collections and collections that remained in place, as well as the determination of their cultural or scientific value and prospects for future use were carried out by the staff of the Rosenberg Operational Headquarters. For this purpose, a separate Science Headquarters (*Sonderstab Wissenschaft*) was created. The task of this *Sonderstab* was to confiscate all scientific developments, documentation, and book collections and to provide them at the request of German specialists who worked for the German military economy and the maintenance of troops. Small teams of German specialists were also formed to investigate specific agricultural research institutions (Kashevarova 2014, 104-109). In the summer of 1942, R. Thiele and Professor W. Kundert worked in libraries and scientific institutions in Odessa, focussing much of their work on the All-Union Breeding and Genetic Institute VASKhNIL. They developed a plan to seize the valuable scientific documentation of the institute as well as the breeding material of the 1942 harvest.[22] The representatives of the Science Headquarters were particularly interested in the Askania-Nova reserve, which was studied in detail, and its library was almost completely seized in April 1942. Throughout 1942, Professor Walter worked on the collection of the Nikitsky Botanical Garden, and Professor Wilhelm Schwartz worked at the biological station in Karadag.[23]

For German agricultural scientists, the invasion of the USSR was a unique opportunity to seize international leadership in a number of areas of agricultural research, usurping Soviet scientific resources. The Research Service formed lists of German agricultural scientists who wanted to join "the study and preservation of the scientific potential of agricultural research institutions, to use the achievements of agricultural science for the effective management of the industry to meet Germany's food security."[24] For example, in September 1941, 51 scientists were sent to the "development of eastern territories", 23 of them to Ukrainian lands.[25]

Directors of leading German agricultural research institutions formed lists of Soviet institutions that they considered necessary to investigate. Two of the most influential scientists in the field of breeding in Germany – Director of the Institute of Breeding Research Wilhelm Rudorf and Director of the Kaiser-Wilhelm-Institut für Biologie Fritz von Wettstein – compiled a list of 68 Soviet institutions that they were interested in, to such regard. The importance of capturing, for example, seed collections was emphasized, for which several expedition groups were organised (Elina 2014, 65). Breeder Klaus von Rosenstiel supervised breeding research in the Ukrainian territories and coordinated these expeditions (Val'ter 2006a, 32). According to the recollections of the workers of the Uladovo-Lyulynets breeding station in 1942–1943, their institution was visited four times by different groups of German scientists who studied and partially seized breeding material and scientific documentation (Borysenko 2009). In turn, this caused competition between German scientists for the right to take possession of the most valuable samples. If it was important for the participants of the expeditions to take them to replenish the scientific base of German institutions, then those German scientists who were appointed as curators of certain Ukrainian research institutions and conducted research work there tried to prevent the export of these materials, at least until the beginning of the retreat of the German contingent from the Ukrainian territories. An example of such a situation was the conflict between HeinzBrucher and L. Flachs over the collections of breeding stations in the Vinnitsa region (Heim 2002, 125-129). Similar episodes are mentioned in G. Walter's memoirs (Val'ter 2006b, 57-58).

Expeditions to study the results of the activities of Ukrainian research institutes were usually accompanied by the military, police and even the SS. The German scientists themselves also had military ranks and wore military uniforms, which contributed to the trouble-free "assistance" of Ukrainian specialists in helping to study the activities of the institution and confiscation of valuable scientific documentation and collections. It is clear that with such "support", access to scientific information was unlimited. In such conditions, it was a feat for Ukrainian scientists to try to hide a valuable scientific product. In their memoirs, German scientists, proudly recall finding caches of valuable scientific property or exposing the substitution of breeding or breeding samples for ordinary ones, which was done by Ukrainian specialists to prevent their export (53; Borysenko 2009). The more cynical is the use of the term "transfer", which was commonly used in the correspondence of scientists, and reports of these expeditions, which carries a semantic load as a voluntary act, although it can hardly be considered as such. The expressions "provision of German

institutions" or "rescue of valuable scientific material" are also used in the context of the export of Soviet scientific property in the event of a mega catastrophe – such as war, or as a result of the introduction of Lysenkoism. Thanks to such formulations, scientists later justified their activities, claiming that they were protecting Soviet research resources, even if it benefited German economy and science at the same time.

c. Cooperation or exploitation of scientific resources?

Each agricultural research institution had its own German curator who controlled its activities and coordinated scientific work. At the initial stage, when there was no clear control by German curators, Ukrainian scientists continued the topics that started in the pre-war period. However, the design of the organizational structure of agricultural research and a clear definition of the powers of the coordination centres changed the list of tasks that German scientists set for Ukrainian colleagues. Starting from the second half of 1942, German specialists began to actively use the scientific bases of the institutes to conduct their research. For example, a well-known chemist and associate professor from Hohenheim, Dr Otto Siegel conducted his research on the chemical composition of organic fertilizers at the research base of the Ukrainian (Regional) Institute of Soil Science, Plant Nutrition and Agriculture (*Institut für Bodenkunde, Pflanzenernährung und Ackerbau*). Dr Neu conducted comprehensive research at the Ukrainian (Regional) Institute of Plant Protection and Pest Control (*Landesinstitut für Pflanzenkrankheiten und tierische Schädlinge*).[26]

Ukrainian scientists were involved as experts in large expeditions of German scientists to explore the occupied territory. For example, the soil scientist and the Ukrainian director of the Ukrainian (Regional) Institute of Soil Science, Plant Nutrition and Agriculture, Hryhorii Makhov, worked in the team of the geographer Otto Schulz-Kampfhenkel. He headed the mapping department of the RFR and used his great influence among the military command to organize a special detachment of special purpose that consisted of scientists called up for military service (Häusler 2007, 169 and 179). Unlike the military geographical units of the *Wehrmacht*, the detachment used aerial photography to refine maps for the military command. Makhov was involved in the work of this special unit as a consultant on soil erosion in Ukraine. In June 1943, field studies of the territory from Kyiv to the Crimea were conducted, and data on the content of humus and various chemical compounds were collected. As a result of the expedition, a map of erosive soils of the occupied Ukrainian lands was created. These data made it possible to develop detailed maps that allowed them to

assess the terrain for the passage of heavily armoured vehicles and the possibility of military camouflage. Participation in the development for the immediate needs of the *Wehrmacht* doomed Makhov to emigration from the Ukrainian lands. But did he really have a choice? In 1944, having already been "evacuated" to the University of Poznan, where all the scientific documentation of the Institute was taken, the scientist was involved in cartographic expeditions on the Rhine Plain, during which maps were improved to assess the possibility of military manoeuvres of the German tank *Tiger* (Val'ter 2006b, 66-69 and 75).

With the beginning of the German retreat from the Ukrainian territories, the second wave of valuable property export began. German curators appointed Ukrainian scientists responsible for the escort of the property on the way. They and the scientific property, accompanied by the military, were taken to Poznan and further to the west. Such a mission fell to Professor Mykola Sharleman, who accompanied the ornithological collection; botanist Lidia Symanska, who was responsible for the preservation of the herbarium from the Nikitsky Botanical Garden; scientists Natalia Desyatova-Shostenko, Olha Radde-Fomina, Kateryna Polonska-Kleopova, and Natalia Osadcha-Yanata were responsible for the herbarium collection at the Institute of Agricultural Botany. Of course, a significant part of Ukrainian scientists wanted to go to Germany, fearing repression by the Soviet government, but there were those who were forced. Professor Volodymyr Artobolevsky recalls in his memoir a statement by the head of the Research Centre, Professor Sommer: "Your consent is not required. We will pack them in boxes together with your collections."[27]

But there were also isolated examples of constructive cooperation. On 17-23 October 1942, the All-Ukrainian Conference on Plant Protection was held in Kyiv. The conference lasted three days, during which more than 40 reports were made. Most of them were from Ukrainian scientists. And although it was an imitation of a scientific discussion, it was a significant event for Ukrainian scientists when they had the opportunity to meet, demonstrate the results of their research, and become acquainted with German achievements in this area.

Conclusion

The Nazi state strongly supported agricultural research, because it had to serve the policy of food, raw material self-sufficiency and the "expansion of living space". The war and occupation of Ukrainian lands created unprecedented prospects for the research work of German agricultural scientists, leaving an imprint on the postulates of scientific ethics. Representatives of the conquerors, under the guise of law enforcement agencies, intensively visited Ukrainian

agricultural research institutions during the occupation period, studying the results of their activities, and confiscating their scientific materials. The significant research base of Ukrainian institutions allowed them to conduct research both in new soil and climatic conditions, and with new breeding and breeding material, which expanded the horizons of scientific research and gave chances for career growth on an individual level. Having a limited number of scientific personnel to develop the agricultural potential of Ukrainian lands, the occupation authorities allowed the functioning of Ukrainian sectorial research institutions. Ukrainian scientists, however, were victims who could only work for the new masters, serving their needs. But in any case, the patronage of the coordinating centres of agricultural research, which operated during the occupation, made it possible to improve the financial situation of employees of Ukrainian agricultural research institutions and gave them more chances to survive in the war. The autonomy of the heads of institutions in choosing research topics remained significant in the first year of the occupation, but in subsequent years, with the strengthening of the coordination system of Ukrainian sectorial research, it was reduced to a minimum. But with the increasing involvement of Ukrainian scientists in the projects of the German side, the level of their expertise in the eyes of the occupation authorities automatically increased, which opened the possibility of including Ukrainian specialists in the development of strategic plans for the development of the industry. However, despite the military conflict of a global scale, and the redistribution of territories by warring states and regimes, agricultural research in the Ukrainian lands continued to develop, and scientific exchange took place, although with a predatory taste.

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