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STALIN'S PLAN FOR THE TRANSFORMATION OF NATURE

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STALIN PLAN OF CONVERSION OF NATURE

No country in the world knows such a majestic, scientifically grounded and successfully implemented plan for transforming the nature of vast spaces, which is outlined by a historic decision of the Council of Ministers of the USSR and the Central Committee of the All-Union Communist Party of Bolsheviks, adopted on the initiative of Comrade Stalin on October 20, 1948—"About a plan of field-afforestation, the introduction of grass crop rotation, the construction of ponds and ponds to ensure high and sustainable yields in the steppe and forest-steppe regions of the European part of the USSR."

The grandiose plan of the projected steppe forest stands is grandiose. To protect against dry winds, improve climatic conditions and primarily the water regime, as well as to protect the soil from erosion and blowing, a system of state forest belts is being created in vast territories of the south and southeast of the European part of the USSR.

The decree of the Council of Ministers of the USSR and the Central Committee of the All-Union Communist Party of Bolsheviks states that these forest belts are necessary "in order to overcome the destructive influence of the dry winds on crop yields, to prevent the fertile soils of the Volga region, the North Caucasus, central black earth regions from being blown away, and to improve the water regime and climate conditions of these areas."

During 1950-1965, it is planned to create the following large state forest belts:

from Saratov to Astrakhan, on both banks of the Volga River—two lanes, 100 metres wide and 900 kilometres long;

in the direction of Penza-Ekaterinovka-Veshenskaya-Kamensk on the North Donets, on the watersheds of the

Khopra and Medveditsa, Kalitva and Berezova rivers—three lanes, 60 metres wide each, with a distance between the lanes of 300 metres and a length of 600 kilometres;

in the direction of Kamyshin-Stalingrad, on the watershed of the Volga and Ilovli rivers—three lanes, 60 metres wide each, with a distance between the lanes of 300 metres and a length of 170 kilometres;

in the direction of Chapaevsk-Vladimirovka-four lanes, 60 metres wide each, with a distance between the bands of 300 metres and a length of 580 kilometres;

in the direction of Stalingrad-Stepnoy-Cherkessk—four lanes, 60 metres wide each, with a distance between the strips of 300 metres and a length of 570 kilometres;

in the direction of Mount Vishnevaya-Chkalov-Uralsk- the Caspian Sea, along the banks of the Ural River—six lanes (three on the right and three on the left bank), 60 metres wide, with a distance between the bands of 200 metres and a length of 1080 kilometres;

in the direction of Voronezh-Rostov-on-Don, on both banks of the Don River—two lanes, 60 metres wide and 920 kilometres long;

on both banks of the North Donets River, from the city of Belgorod to the Don River, there are two lanes, 30 metres wide and 500 kilometres long.

The creation of these state protective forest belts is entrusted to the USSR Ministry of Forestry.

The total length of large state protective forest belts will be 5320 kilometres, forest planting area—117.9 thousand hectares.

The decision of the Council of Ministers of the USSR and the Central Committee of the All-Union Communist Party of Bolsheviks also indicated the need to take measures to preserve all existing valuable forests in the steppe and forest-steppe regions of the European part of the USSR.

In this regard, it is very important to preserve existing forest areas such as Shipov Forest, Borisoglebsky Forest, Buzuluksky Bor, Shatilovsky Forest, Khrenovsky Bor, Black Forest, Tula Forests, Leninsky and Manychsky Leskhozes in the Rostov Region, watershed forests of the Kuibyshev and Ulyanovsk regions, Veliko-Anadolsky forestry and several others.

Along with the organization of large state protective forest belts, the Council of Ministers of the USSR and the Central Committee of the All-Union Communist Party of Bolsheviks stipulate the creation of protective forest stands on the fields of collective farms and state farms, which will be one of the most important conditions for ensuring high crop yields, overcoming the harmful effects of dry winds on crops, and improving the water regime and elimination of the processes of destruction of the soil cover (leaching and blowing of soils) in the steppe and forest-steppe regions of the European part of the USSR.

Protective forest stands on the fields of collective farms and state farms in the period 1949-1965 should be created on an area of 5709 thousand hectares, of which by the forces and means of collective farms with the help of the state - on an area of 3592.5 thousand hectares. A plantation plan of 580 thousand hectares has been established for the USSR Ministry of State Farms.

Simultaneously with the creation of state protective forest belts along the banks of the Volga, Urals and watersheds, the USSR Ministry of Forestry must also carry out a program for afforestation in the amount of 1536.5 thousand hectares. This will be afforestation on ravines and gullies, work in the state forest fund and in collective farm forests. The Ministry of Forestry needs to finish by 1965 the afforestation of all ravines and beams on collective farm lands in the steppe and forest-steppe regions of the European part of the USSR.

The state forest protection zones outlined by this plan are divided into two types: watershed and water protection. Dividing forest strips extend, as a rule, along the most elevated spaces between the Ural and Volga rivers (Chapaevsk-Vladimirovka stripes), between the Volga and Don (Kamyshin-Stalingrad-Stepnoye-Cherkessk stripes) and between the main tributaries of the Don (Khoper-Medveditsa), and also between the Don and the North Donets. Their main purpose is to protect against dry winds. Water-protection forest strips, planted along the banks of the largest rivers of the southeast: the Urals, Volga, Don, and North Donets, should help regulate the water regime of these rivers important for our national economy.

How large this area of forest stands now being designed is compared with the forest stands that we had before the Great Patriotic War, can be illustrated by the following data (in thousands of hectares):

Форма лесонасаждения	Россия	СССР	
	1898—1915	1927—1941	1949—1965 (только в степных и лесостепных районах европейской части СССР)
Государственные лесные защитные полосы	Не было	Не было	117.9
Полезащитные полосы	11	468.3	5709
Овражно-балочные насаждения . . .	170	181.0	386 (часть)
Пескоукрепительные насаждения . . .	52	265.6	322 (часть)
Лесные культуры . .	34.6 (1817—1917)	Около 1500	1150.5

The implementation of the Stalin plan of afforestation will fundamentally change the nature of our steppe and forest-steppe areas, and at the same time the conditions of agriculture in them, which will be free from climatic hardships with their droughts and dry winds. The climate of the steppes will be moistened, and crop yields will increase and become sustainable.

The implementation of the measures outlined by this plan will provide a new step in the development of our socialist agriculture and our entire economy—another step on the road to communism.

This remarkable plan was developed on the basis of the scientific works of prominent Russian scientists—V. V. Dokuchaev, P.A. Kostychev, V. R. Williams, G. N. Vysotsky and others, as well as a number of research institutes created after the Great October Socialist Revolution. These works proved the effectiveness of steppe afforestation and laid a solid foundation for measures on forest cultivation in arid areas. Thus, the Stalinist plan for the transformation of nature is fully based on deep scientific foundations, the development of which is the pride of our domestic science. The implementation of such a grandiose plan is possible only in the country of victorious socialism, which fundamentally changes the attitude of society towards nature.

The greatness of the socialist system of society's attitude to nature, which is clearly illustrated by the plan of field-afforestation, becomes especially evident against the background of the unbridled plunder of natural wealth and the systematic destruction in the capitalist countries of the basis of fertility - soil.

The founder of scientific socialism, K. Marx, wrote more than 80 years ago that "... the capitalist system is contrary to rational agriculture, or that rational agriculture is incompatible with the capitalist system..." (Capital, vol. III, 1949, p. 127).

The current state of US agriculture is a clear confirmation of this position of Marx. In a short historical period, as a result of the predatory staging of agricultural production in the USA, vast areas of previously cultivated and fertile lands were completely lost for agriculture.

According to Dr. Bennett, made by the US Congress in 1939, only soil erosion (flushing—V. S.) destroyed 112,800 thousand hectares of cultivated land (Carey Mac-Williams. "Poor Land." Foreign Publishing House Liters, Moscow, 1949, p. 24).

On extensive Black storms rage every year in the far western states of the United States, blowing over several thousand hectares of cultivated soil over several hours, often with crops. These same elemental forces damage the vast expanses of arable land in Canada and Mexico. On a larger or smaller scale, soil destruction and declining fertility are observed in almost all capitalist, colonial and semi-colonial countries, bringing ruin and famine to millions of farmers in these countries.

The unbridled process of soil destruction in the United States shows how deeply Marx was right in saying that "... any progress in capitalist agriculture is not only progress in the art of robbing a worker, but also in the art of robbing the soil, any progress in increasing its fertility for a given period **at the same time, there is progress in the destruction of the permanent sources of this fertility** (emphasized by me.—V. S.). The more famous a country, such as, for example, the United States of North America, emanates from large-scale industry as a hidden basis for its development, the faster this process of destruction "(Capital, Vol. I, 1949, p. 509).

Back in the 19th century, the leading people of our country put forward the idea of combating drought by developing forest stands in the steppes. However, in conditions of tsarist Russia, with its private ownership of land, primitive agriculture, with

the landlords' stagnation and their disinterest in the costs of improving field cultivation, as well as with the complete indifference of the autocratic regime to the welfare of the people, measures to combat drought could not be practical implementation. How little attention was paid then to this task is shown, at least, by the fact that even the fixing of moving sands, which at that time were involved to some extent, was carried out over the years 1898-1907 only on an area of 52 thousand hectares. Little more has been done in the field of forest reclamation in the years leading up to the Great October Revolution.

More than a hundred years ago, far from unsuccessful experiments were carried out to create forest stands in the south of our steppes. But steppe afforestation, and especially effective in combating drought—strip, did not receive any significant scope in the pre-October period. Moreover, if in the second half of the last century separate forests and stripes were created in different places of our southern steppes, then by the time of the Great October Revolution steppe afforestation had almost completely ceased. Already at the congress of steppe forest owners and foresters in 1891, the question was raised whether further work on afforestation of the steppes should be stopped altogether. But the drought that captured in 1891 the entire chernozemic south of Russia caused an enormous crop failure and famine,

The expedition was to develop measures to combat drought. Having brilliantly fulfilled their task, the expedition came across the inertness of the tsarist government. Its recommendations not only did not receive practical implementation, but the Forestry Department of the Ministry of Agriculture and State Property simply decided to curtail forestry in state-owned steppe forestries. Of the three experimental steppe forestries that developed on the basis of the experimental sections of the Dokuchaev expedition, the

Derkul forestry (in the former Starobelsky district of the Kharkov province) was completely closed, the Kamenno-Stepnoe forestry was transferred to the management of agricultural experimental organizations and only the Veliko-Anadolskoye remained under the responsibility of the Forestry Department, but afforestation in it greatly narrowed. The war of 1914-1918 suspended the work on steppe afforestation.

The situation is fundamentally changing only after the victorious conquest of power by the proletariat under the leadership of the Lenin-Stalin party. The brilliant Stalinist policy of socialist industrialization of the country and the collectivization of agriculture created all the prerequisites for the widest development of steppe afforestation and the elimination of drought and crop failures.

From the very beginning of its existence, Soviet power attached great national importance to this problem. Already in 1924, after the great drought of that year in the Volga region, JV Stalin wrote about the need to deploy a decisive struggle against drought and to attract wide circles of the peasantry to reclamation measures: “This will be the beginning of a revolution in our agriculture” (Soch., vol. 6, p. 275).

And in the future, Comrade Stalin always showed and continues to pay exceptional attention to this national economic problem, carrying out personal management of relevant measures.

In 1931, the All-Union Conference on Combating Drought, convened by the People's Commissariat of Agriculture of the USSR, was held. Speakers at this conference, V. M. Molotov and M. I. Kalinin, especially convincingly emphasized that under tsarism the question of combating drought could not be posed as a national task and that only under the Soviet system this issue not only became one of the primary national problems , but also provided with all the prerequisites for its successful resolution. Then, in 1931,

a decree of the Council of People's Commissars and the Central Committee of the All-Union Communist Party of Bolsheviks (Bolsheviks) was published on the creation of extensive field-protective strip stands in irrigated and irrigated territories.

In 1934, at the XVII Congress of the CPSU (B.), Comrade Stalin again noted the great importance of planting forests and forest shelter belts in the eastern regions of the Volga region. The party and the government paid much attention to the same task in the second and third five-year plans, which was reflected in the resolution of the Council of People's Commissars of the USSR and the Central Committee of the All-Union Communist Party of Bolsheviks of October 26, 1938 “On measures to ensure a sustainable crop in the arid regions of the southeast of the USSR” and in a number of subsequent decisions and instructions of the governing bodies. The February plenum of the Central Committee of the All-Union Communist Party of Bolsheviks in 1947 also made a decision on the need for the development of field-afforestation afforestation.

The party and the government paid special attention to the training of specialists. A network of universities and technical schools has been created that train specialists in afforestation of the steppes, and special research institutes and stations for agroforestry have been opened. Among them, the All-Union Agroforestry and Reclamation Institute in Moscow, the Kharkov Institute of Agroforestry and the Research Institute of Agriculture of the Central Black Earth Band named after V. V. Dokuchaev in the Stone Steppe of the Voronezh Region were especially notable. The intensive and fruitful activities of these research institutions have finally proved the great importance of steppe afforestation for combating drought and obtaining high and sustainable yields. She also helped to develop new structures and types of shelterbelts, the rules for their distribution and agricultural practices for their creation.

Studies have shown that shelterbelts have a multilateral effect on the surrounding space. They reduce the speed and change the direction of air flows (wind), reduce the evaporation of plants and soil, promote snow accumulation and more even distribution of snow, create a more favourable temperature regime of air and soil, increase the absolute and relative humidity of the air, reduce surface run-off, delay soil erosion protect fields from black storms and wind erosion.

As a result, forest strips greatly contribute to increasing the yield of crops: cereals by 20-30%, garden and melons by 50–75%, grasses by 100-200%. Grain quality is also improving. The positive effect of forest strips affects them at a young age, from 3-5 years. With the growth of the bands, the zone of their influence also increases, and therefore their effectiveness also increases. During severe droughts, when fields in the open steppe yielded an insignificant crop, under the protected forest strips, a reduced but still significant yield was obtained, with an increase of 100-300% of the crop in the steppe. This was noted, in particular, during the droughts of 1921, 1936, 1939, 1946. Thus, forest shelter belts create conditions for the organization of a sustainable crop base.

New forest plantations in areas where there is now an extreme shortage, and in some places a complete lack of forest, will give a number of valuable products delivered by the forest (wood, tannins, fruits, etc.). Forest strips will also create favourable conditions for nesting of birds useful in agriculture.

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Only in the Stalin era, the work of Soviet research institutions and individual scientists finally proved the indisputable benefits of field-afforestation, and techniques for more successful afforestation have also been developed. If in the pre-revolutionary period in this regard the works of V. V.

Dokuchaev, P. A. Kostychev and K. A. Timiryazev gave a lot, then V. R. Williams and G. N. Vysotsky, having begun their activities before the Great October Revolution, successfully completed their works already in the Soviet era, which provided unlimited opportunities for scientific work.

Of exceptional importance are the work of Academician T. D. Lysenko. He proposed a new method for nesting crops of oak and other tree species under the guise of crops. This method not only protects the crops of tree species from being drowned by steppe herbs and reduces the cost of creating and raising steppe strip plantations, but also guarantees their continued successful growth.

The method of T. D. Lysenko has been approved by our higher state institutions and is recommended for widespread implementation. Therefore, it is necessary to dwell on it in more detail.

Along the strip, the row spacing is set at 5 metres, and in the perpendicular direction—at 3 metres. At each intersection, 30–35 viable acorns are sown in 5 holes (nests). The number of such oak nests per hectare will be 667, and for sowing per hectare of the forest strip, approximately 1 centner of acorns will be required.

Sowing of oak is done in spring by slightly sprouted ("bent over") acorns. T. D. Lysenko recommends sowing acorns as early as possible, so that before the onset of high summer temperatures and drought, seedlings of oak have already grown stronger.

When sowing oak at the very intersection of lines, they make a hole and put 6-7 acorns in it, with a small amount of mycorrhizal earth (land from under the oak forest). A hole with acorns is closed with a layer of moist earth of 4-6 centimetres, slightly trampled on the ground with your foot and covered with another layer of loose earth of 1-2 centimetres on

top. Around this central hole, at a distance of 30 centimetres from it, another 4 holes are seeded in the same way.

The entire area of the forest strip after sowing acorns or before sowing is sown with that crop, which should occupy this area (as part of the field) for crop rotation. In the fields occupied since the autumn of the previous year with winter breads and perennial herbs, acorns are sown in a field sown with agricultural crops.

In his instruction, T. D. Lysenko details agricultural technology for sowing crops, caring for them, and harvesting them.

In the autumn of the first year of crops, the entire area of the forest strip, including strips with nests of oak shoots, is seeded with rye. In this sowing, which is carried out along the forest strip with a tractor 24-row disc seeder, the three coulters (sixth, twelfth and nineteenth) should not sow rye, but the seeds of shrubs (yellow acacia, etc.), for which appropriate partitions are made in the seed box of the seeder. To adjust the seeding rate of seeds of shrubs, an appropriate amount of rye seeds is added to them.

Large seeds of shrubs (for example, hazel, etc.), which cannot be sown due to their size with the seeder at the same time as sowing rye seeds, should be sown in autumn under the hoe in the same rows in which the seeds of other types of shrubs are already sown.

In the same autumn, in the middle of the transverse three-metre row-spacings, it is necessary to sow one hole of seeds accompanying oak tree species (maple, linden, etc.).

At the same time, T. D. Lysenko indicates that in the same row between the nests of the oak it is best to sow the seeds of one accompanying breed, and in the other row the other, paying attention to the selection of fast-growing and fruit species.

Sowing rye on strips between the nests (holes) of oak seedlings is carried out in one pass of a 10-row disk horse-seeder, directly on the nests of oak seedlings.

The subsequent sowing of rye is no longer carried out over the entire area of the forest strip, but only over 4-meter aisles along the strip. When harvesting rye, which is produced, as a rule, by self-propelled combines, the tops of shrubs are cut.

Rye crops cease in the fourth year. Oaks by this time will be four years old, and related tree species and shrubs will be three years old.

T. D. Lysenko believes that after this, the forest strip can be left for its growth in its pure form, i.e., without sowing bread between rows. Further he points out that in the fifth year of life of an oak tree and in the fourth year, trees of concomitant tree species placed in groups in nests should also give good growth and obscure the soil.

Crops of oak and other tree species in 1948 and 1949 according to the method and under the guidance of T. D. Lysenko, which have already yielded excellent results, have brilliant prospects and should find application on collective and state farm fields.

The variety of soil and climatic conditions of the steppes subject to afforestation, the need to implement the planned afforestation plan in a short time at the lowest possible cost and to guarantee the further successful education of these stands, all this requires not only widespread use of all scientific data, but also the organization of comprehensive research.

The doctrine of steppe afforestation in no country has reached the level to which the Communist Party and the Soviet government raised it, based on the works of Russian and Soviet scientists—V. V. Dokuchaev, P.A. Kostychev, V. R. Williams, G. N. Vysotsky, I. V. Michurina, T. D. Lysenko and scientific work created in the post-revolutionary period of special research institutes. The grandeur and versatility of the

implementation of the Stalinist plan for the transformation of nature still requires the development of many issues and the involvement of a number of research institutions in this task.

* * *

Naturally, Soviet science should first of all use and creatively develop all that is valuable that was obtained by remarkable Russian scientists—V. V. Dokuchaev, P. A. Kbstychev, V. R. Williams, G. N. Vysotsky.

The general direction of research work on issues related to afforestation of the steppes was given with extreme clarity and depth in the Proceedings of the famous expedition organized by V. V. Dokuchaev in 1891. This expedition not only did a lot to understand the nature of our steppes, not only developed a new scientific method for substantiating economic measures to combat drought, but also outlined concrete ways to deal with this natural disaster.

At three experimental sites—in Veliko-Anadol, near Mariupol, in the Derkul steppe of the former Starobelsky district of the Kharkov province and in the Kamennaya steppe in the former Voronezh province - measures were studied that were possible only in Soviet times. The principles and methods laid down by V. V. Dokuchaev as the basis for the work of this expedition were completely new for that time; to a certain extent, they have not lost their relevance to this day.

Dokuchaev so defined the objectives of his expedition: “More precisely, to study these forces and phenomena (that is, the factors of agriculture.—V. S.) in their interaction and causal relationship, to find out the kind and size of the natural enemies of agriculture, to find such which make it possible to deal with the aforementioned adversities with the help of various appropriately directed measures, to put a number of experimental works aimed at improving the conditions of

agriculture, forestry and water management in southern Russia, take these experiments into account, find out their positive and negative Ron and practical expediency are the pressing immediate tasks of modern agricultural Russia and Russian agronomic thought "(V. V. Dokuchaev." Proceedings of the expedition equipped with the Forest Department. Report to the Ministry of Agriculture and State Property for 1894. St. Petersburg, 1895, pp. 1-2).

Particularly detailed scientific research on the fight against climatic hardships in our chernozem zone was presented by V. V. Dokuchaev and his associate N. M. Sibirtsev in the introduction to the Proceedings of the named expedition. Stressing the need for an integrated research method, the authors note that the expedition needs to put the matter in such a way that "all natural factors (soil, climate with water and organisms) are investigated and tested, if possible, comprehensively and without fail in their mutual connection" (V. V. Dokuchaev and N. M. Sibirtsev. "Proceedings of the expedition equipped with the Forest Department under the leadership of Prof. Dokuchaev. Introduction. 1894, p. 15).

Thus, already in the program of this expedition, a broad geographical approach to solving the problem was identified, an approach whose expediency was then brilliantly proved not only by the "Works" of this expedition, but also by the entire agronomic and
forest science.

The remarkable Russian scientist G. N. Vysotsky gave the steppe problem more than 40 years of his life. He not only widely involved the data of climatology, soil science and biology in resolving the issues of creating steppe stands, but also actively developed various aspects of these sciences. But his main merit was that he, as an employee of V. V. Dokuchaev, introduced a comprehensive, geographical method to all parts of his scientific research. He outlined a program for

further research in this area; his work to a large extent remains and still guides in solving the problem of steppe afforestation.

Of great importance are the works of P. A. Kostychev, who clarified the conditions ensuring soil fertility, and showed the role of soil structure in obtaining high yields.

All these ideas are in perfect harmony with the theory of our other major soil scientist, biologist and geographer of a wide range—Academician V. R. Williams. Developing the ideas of Dokuchaev and Kostychev, he created a wonderful doctrine of the grass field farming system. This system, together with shelterbelts, which are included as an integral part of it, provides a reliable means to combat drought and provides high and sustainable crops and elevates agriculture to a higher level.

V. R. Williams wrote: "A further rise in agricultural production in the steppe regions of the Union is unthinkable, firstly, without the widespread introduction of the system of forest strips in agricultural production and, secondly, without the introduction of grass-field farming system on the inter-strip spaces, an integral element of which are forest strips" (V. R. Williams. "Forest at the Service of the Harvest." Izvestia, October 21, 1938).

Our ingenious biologist Michurin also devoted one of his articles to forest protection afforestation, perfectly understanding all its importance for raising the level of agriculture, in particular gardening.

V.V. Dokuchaev, P.A. Kostychev, V. R. Williams and G. N. Vysotsky were not only the founders of Russian soil science, which glorified our science throughout the world. They were also the creators of the science of steppe afforestation, which the Americans studied with us, by their own admission.

The restructuring of biological science based on the teachings of Michurin and Lysenko after the August session of

the All-Union Agricultural Academy of Agricultural Sciences in 1948 was of great importance for steppe afforestation. The provisions and methods of Michurin and Lysenko should be widely used in the theory and practice of afforestation.

As mentioned above, academician T. D. Lysenko, on the basis of Michurin biological science, has developed a new, nesting method of sowing tree species. Its instruction on the creation of shelterbelts has received full approval and should, as a rule, be applied in the practice of steppe afforestation.

Thus, there are all prerequisites for the successful implementation of the Stalinist plan for the transformation of nature. The time elapsed since the publication of this plan showed that it is not only being successfully implemented, but also overfulfilled. According to the Central Statistical Office under the Council of Ministers of the USSR, a total of 590 thousand hectares of protective forest stands were planted, of which in 1949 over an area of more than 370 thousand hectares. By collective farms and state farms, the planting plan for 1949 was almost doubled over. 800 thousand hectares of land have been prepared for future planting. Such an overfulfillment is natural, since the majestic Stalinist plan for the transformation of nature was met with unprecedented enthusiasm by the entire Soviet people.

This plan, as well as the plan for the creation of industrial significance in the southeast, could not but captivate the wide circles of Soviet scientists with its prospects.

The Academy of Sciences of the USSR and some union academies, universities and other universities, as well as research institutions, have widely launched scientific work on the steppe afforestation.

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Shortly after the publication of the party and government decree of October 20, 1948, the Presidium of the USSR Academy of Sciences decided to include its institutes in the development of questions on this problem, and in February 1949 submitted to the government the project of organizing an appropriate expedition.

On July 24, 1949, the Council of Ministers of the USSR by a special decree allowed the Academy of Sciences to organize a comprehensive scientific expedition on field protection afforestation.

Based on this decision, the following detailed program was developed:

1. The study of forest conditions in the areas of state stripes and shelterbelts on collective farm lands.

2. Obtaining high-quality seed material in the required quantity and growing high-quality planting material in nurseries.

3. The study of the vital properties of tree and shrub species and their selection for various climatic, soil and hydrological conditions.

4. The study of the mutual influences of various tree and shrub species, grassy vegetation and the environment in forest strips, the discovery of such combinations of them that would give them stability in the fight against adverse natural influences, would require less care and would be most economically economical.

5. The study of the surrounding fauna from the point of view of its beneficial and harmful effects on plantings and field crops.

6. The study of the mutual influence of forest strips and the surrounding space with field crops on it and the development of principles for the most rational allocation of strips in the territory.

7. Agrotechnics sowing and planting forest strips, care for them, their cultivation and renewal, as well as the correction of unsuccessful or damaged strips.

The expedition was based on the ideas expressed by the founder of scientific methods of combating drought, Professor V. V. Dokuchaev. He wrote: “When studying these factors (natural factors of agriculture.—V. S.), and especially when mastering them, it is absolutely necessary to keep in mind, if possible, the **whole, whole, inseparable nature**, and not its fragmentary parts”.

However, it is not enough to recognize the importance of these thoughts—it is necessary to find ways of their practical application. Concretizing these ideas in relation to the problem of afforestation, it is necessary to take into account that the afforestation band (like any part of the forest) constitutes a complex plant community in which different plant species, growing together, have a great mutual influence. In this community, even in the simplest case, when the strip consists of one tree species and there are no bushes in it, there are herbaceous plants and various plant microorganisms (bacteria, fungi, algae) that interact with each other. Interactions are even more complicated when there is a layer of shrubs in the forest strip and several different tree species are included in it. In this case, the nature of the interactions that may be as useful, and harmful to plants, extremely complicated. But since the growth and development of tree species and other plants in the forest strip is naturally determined by environmental conditions (climate, soil, hydrological conditions and animals inhabiting the strip), the nature of the interaction between plants will be different in different environmental conditions, the factors of which are not only themselves affect each other, but also experience the effects of vegetation. Of course, interactions of both all plants and tree species between themselves and with environmental factors will proceed differently at different ages

of the plants themselves, in particular at different ages of planting of tree species (hydrological conditions and animals inhabiting the strip), then the nature of the interaction between plants will be different in different environmental conditions, the factors of which not only affect each other, but also experience the effects of vegetation.

The whole history of steppe afforestation clearly shows that the more fully took into account the whole range of natural factors of the geographical environment in their interaction with each other and with the vegetation of the steppe stands, the more successful afforestation was.

The experience of the expedition of the USSR Academy of Sciences in 1949 showed the same thing well.

Having started its activities in August, the expedition as a whole continued to work until November 1949 inclusive. Her detachments carried out research work of serious practical, national economic importance.

The forest-growing conditions of the territory of the routes of protective forest belts and areas of creation of forests of industrial importance were studied. The obtained data is needed not only now, when allotting the routes of state protective forest belts,
but they will be used in practice in the future - for a number of years of cultivation on forest stands.

A comprehensive study of the forest-growing conditions of the tracks of forest strips provided agroforestry zoning of the territory of the tracks and the assessment of the selected areas by their forest-growing properties. Having these data, industrial organizations had the opportunity to place routes and develop a system of growing forest strips with the greatest effect.

The natural plantings in the areas of the routes of the state protective forest belts were examined to rationalize their farming and organize seed farms on their basis.

The study of artificial plantations in the steppe and especially semi-desert zone helped substantiate the assortment of sustainable tree and shrub species and develop agricultural technology for growing protective forest belts and oak forests of industrial importance.

Measures have been developed to combat growing ravines and landslides, as well as to use surface runoff to construct new ponds and restore old ones that have become unusable.

The systematics of solonetzes by depth of groundwater, salts, and solonetzic horizon is described in detail. The systematics of floodplain soils was re-built. Such work on a vast territory was completed for the first time.

Soil grouping by forest conditions was carried out. All their diversity is reduced to three groups: 1) forest-suitable soils without land reclamation; 2) forest soils after reclamation; 3) forest-unsuitable soils in the given time.

Materials recommending weed control measures have been compiled.

For the southern and south-eastern regions, a system of measures has been developed for regulating meltwater runoff and combating soil erosion, which consists in altering the micro-relief of the chill by furrowing, especially debris. Crafting of earthen rollers should be mandatory for autumn ploughing. The retention of melt water by earthen rollers with jumpers will increase the growth of forest stands, and each meter of growth of forest strips in height is 25 metres of arable land protected from drought and wind erosion.

The existence in the Voronezh region of a whole group of steppe, drainless lakes, very little mineralized, has been established. At the same time, it was possible to identify the presence of undoubted signs of cyclic fluctuations in the level and volume of the water mass, which is a consequence of the corresponding climate fluctuations. In practice, this makes it

possible to predict the future regime of these lakes, which is important in connection with their forthcoming flooding.

The conditions determining the development of mycorrhiza, i.e., fungi living on the roots of tree species, are clarified. The introduction of nitrogen fertilizers had a positive effect on the development of mycorrhiza, subject to a certain ratio of nitrogen to phosphorus and potassium. The toxic, harmful effect of some soils on the development of mycorrhizal fungi has been established. A microbiological study of the steppe soils occupied by forest belts showed that their micro-population undergoes a certain shift, approaching in a number of indicators to the micro-population of grey forest soils.

Zoologists managed to find out the extent of damage caused to planting by the most important forest pests in the steppe, as well as to examine the infection by harmful insects and rodent populations of soils of planned and created routes.

The zoologists also faced the problem of determining the patterns of changes in animal steppe communities during forest cultivation. The knowledge of these patterns makes it possible to correctly predict the occurrence of pests and the direction of the spontaneous process of changing fauna in the direction that most suits the interests of the national economy.

As regards the issues of selection of forest tree species, the following was established as a result of the work of 1949: a) the highest drought and salt tolerance of the early-blooming form of pedunculate oak growing in the upland part allows it to be recommended for cultivation in more arid regions and on solonetzic soils; b) the high drought tolerance and heat tolerance of pine of the pine forests of Western Siberia gives reason to recommend it for arid regions of the European part of the USSR; c) the presence in the structure of Daurian larch of a special geographical form, common in the Amur River basin and distinguished by a long

period of vegetation and rapid growth, allows you to begin the experience of introducing it into the culture of the European part of the USSR.

Researchers are studying the fruiting processes of tree species, mainly oak, in order to obtain an annual acorn crop to provide a field-afforestation plan.

A study of the damage to acorns during their transportation and storage showed that the main reasons for the low quality of acorns at this time and possible losses in the winter of 1949/50 are: insufficient quality of acorns at the collection sites; loading into cars of unsorted and mechanically damaged acorns; transportation of acorns over long distances in conditions conducive to mass rotting of seed material; negligence during loading and unloading, causing massive mechanical damage and massive infection. Pathogens for acorns are currently being identified. In the fall, experiments were carried out to store acorns in different natural conditions.

All the research work of the expedition, already in the process of field work, ensured the introduction of research results into the practice of production surveys and designs. This was achieved by close, direct connection of all scientific research conducted with the work of expeditions of the respective ministries.

In addition to the expedition, the USSR Academy of Sciences organizes a permanent station for afforestation on the basis of the Krasnooktyabrsky forestry in the Voroshilovgrad region (the former Derkulsky section of the Dokuchaev expedition). This territory is very convenient for organizing such a station. It has forest strip plantations of more than 50 years of age, as well as young plantings.

The great Stalinist plan for the transformation of nature is being successfully implemented by the Soviet people, is being implemented, is becoming a reality. According to the tradition

of the fulfillment of the five-year plans by the Soviet people, the Stalinist plan for the transformation of nature is also being implemented ahead of schedule.

In his report on the 32nd anniversary of the Great October Socialist Revolution, G. Malenkov said: “The decision of the party and the government, adopted a year ago, on the plan of field-afforestation, the introduction of grass crop rotation, the construction of ponds and ponds to ensure high and sustainable crops, is carried out successfully. Already planted protective forest stands on an area of more than 500 thousand hectares. An even larger area was prepared for planting in 1950” (G. Malenkov, “32nd Anniversary of the Great October Socialist Revolution.” Pravda, November 7, 1949).

Soviet scientists working on the implementation of the magnificent plan for the transformation of nature are proud of their participation in the implementation of this plan, which the whole people called Stalin, proud of their participation in the construction of a communist society under the leadership of the Bolshevik Party, under the leadership of our great leader, Comrade Stalin.