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USSR Report

AGRICULTURE

(FOUO 6/81)

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CONTENTS

AGRO-ECONOMICS AND ORGANIZATION

METHODS FOR STIMULATING AGRICULTURAL PRODUCTION OUTLINED

Moscow VOPROSY EKONOMIKI in Russian No 6, Jun 81 pp 3-14

[Article by A.I Arkhipov, candidate of economic sciences and department head at Institute of Economics of USSR Academy of Sciences: "Planning and Economic Stimulation of Agricultural Production"]

[Text] The 26th party congress defined the principal tasks, methods and specific measures for further developing the country's agriculture. "If we are speaking about agriculture on the whole" emphasized L.I. Brezhnev in his report delivered before the 26th CPSU Congress, "then it is confronted by the same principal problem that confronts other branches of the national economy -- raising efficiency and quality. In the future, we will supply agriculture with considerable financial and material resources and continue the planned conversion of this branch over to an industrial basis. But today the center of gravity -- and this is a distinctive feature of the agrarian policies during the 1980's -- is shifting over to the return from capital investments, to growth in agricultural productivity and to strengthening and improving its contacts with all branches of the agroindustrial complex."

Such orientation of agriculture towards the intensive factors of development and strengthening the factors of efficiency, aimed at achieving high final results, is the result of all preceeding development of the branch. It became possible owing to the fact that during the years of the March (1965) Plenum of the CC CPSU, which defined the important trends for all subsequent development of agriculture, many large-scale problems associated with improving agriculture were solved throughout the country. This branch has been converted into a highly developed sector of the economy. As a result of great capital investments in agriculture in recent years and also in those branches of industry which support agricultural production, the technical equipping of the kolkhozes and sovkhozes has improved considerably. Agriculture has been raised to a qualitatively new level, it has become more productive and it has more funds and energy at its disposal. The logistical potential of the branch has increased considerably and the character of agricultural production has changed. By the beginning of 1980, the fixed productive capital of agriculture exceeded 220 billion rubles and thus compared to 1965 it has increased by a factor of 2.9 and its power engineering capabilities -- by a factor of 2.5.

During the course of consistent implementation of Lenin's agrarian policies and during the years of the last three five-year plans, the industrial base of

agriculture developed and became stronger and its contacts with other spheres of production became more firm. A number of specialized and independent large-scale branches were created anew throughout the country: water management and land reclamation, machine building for animal husbandry and feed production, rural construction and the mixed feed and microbiological industries. Tractor and agricultural machine building, the production of mineral fertilizers and the industry which processes agricultural raw materials all underwent accelerated development. All of these factors taken together constitute a single agroindustrial complex, the principal task of which is that of providing reliable support for the country in the form of food and agricultural raw materials.

Following the March (1965) Plenum of the CC CPSU, large-scale capital investments were carried out in the interest of developing the use of chemical processes and land reclamation and this made it possible to utilize more efficiently these intensive factors for growth in agricultural production. The area of irrigated and drained lands throughout the country has presently reached almost 35 million hectares. A complex program is being carried out aimed at improving agriculture in the nonchernozem zone of the RSFSR. Concentration and specialization of agricultural production and agroindustrial integration have become more deep-seated and widespread in nature. A great amount of attention is being given to the development and implementation of economic measures for improving agriculture, especially the planning of production operations, the procurements of agricultural products, price formation and the issuing of credits and wages. The party is striving to ensure that all of the diverse economic relationships within the farms and the entire agroindustrial complex on the whole serve to create a community of interests for the state, the kolkhozes and the direct producers of products.

The realization of these and other measures aimed at improving agriculture has produced perceptible results. Agricultural intensification has even made it possible, with a reduction in the number of workers, to achieve constant increases in output volume. In a computation per hectare of agricultural land, it increased during the past decade by a factor of 1.3 over the figure for the preceeding decade.

During the years of the Ninth and Tenth Five-Year Plans, the average annual volume of agricultural output increased by 23 percent above the figures for the two preceeding five-year plans. "In past years" commented L.I. Brezhnev during the July (1978) Plenum of the CC CPSU, "as a result of tremendous efforts on the part of the party and people, the productive forces of the countryside were raised to a new level, increases took place in the scales of production at kolkhozes and sovkhozes, the collectivization and division of labor underwent further development and economic contacts between branches of the agroindustrial complex were expanded and became more complex in nature. All of these profound changes objectively require further improvements in the economic mechanism. This involves those problems concerned with planning, motivation, strengthening cost accounting and improving relationships between all branches constituting the agroindustrial complex."

In November 1980, based upon the decisions handed down during the 25th party congress and the July (1978) and subsequent Plenums of the CC CPSU, the CC CPSU and the USSR Council of Ministers adopted the decree entitled "On Improvements in Planning and Economic Incentives for the Production and Procurement of Agricultural Products," which calls for a system of basically new measures for further improving planning

and economic incentives in behalf of agricultural development and directed towards increasing the production and procurements of agricultural products and strengthening the kolkhoz and sovkhoz economies. From an economic standpoint, these measures are aimed at ensuring that the farms achieve the final results-- a maximum possible increase in farming and animal husbandry output and improved operational efficiency and quality. In preparing the principal conditions for the mentioned decree, the experience and comprehensive operational practice of kolkhozes, sovkhozes and interfarm enterprises and associations were taken into account.

Planning represents a most important lever for controlling agriculture. During the July (1978) Plenum of the CC CPSU, in discussing the need for implementing improvements in planning, L.I. Brezhnev emphasized: "We must develop the principles for planning and the issuing of incentives which, during this modern stage, will create more favorable conditions for expanded reproduction, improve the validity of plans and ensure the elimination of the subjective approach still being employed in many areas for composing the plans." It is possible to single out several basic aspects which should be taken into account when improving the system of planning. First of all, there should be improvements in planning work carried out at all levels of control over agricultural production. Secondly, the need for raising the efficiency of social production based upon accelerated scientific-technical progress and an increased role being played by the intensive factors of development. Thirdly, there is the need for ensuring a proper balance in the five-year and annual plans for agricultural development between the production volumes and state procurements of products on the one hand and the logistical and financial resources, fixed productive capital and capital investment volumes on the other. Moreover, the plans must call for the formation of those material and financial reserves required for stable, proportional and balanced agricultural development. Finally, improvements in planning work necessarily require the proper combination of centralized management of agriculture with the further development of economic independence for enterprises,,the elimination of petty guardianship over the farms and the development of their initiative and increasing the responsibility of leaders, specialists, kolkhoz members and workers for the development of agricultural production and increasing their interest in the final results of their labor.

Within the overall system for planning and economic incentives, importance is attached to the establishment of a sound plan for the procurement of agricultural products. The sound establishment of the volume and structure of procurements, coordinated with the long-range plan for developing the economy determines to a considerable degree the rates of development for certain branches, while promoting a strengthening of production specialization and concentration and a correct solution for the problems associated with stimulating production.

Following the March (1965) Plenum of the CC CPSU, the experience gained in using firm plans for the procurements of agricultural products confirmed the advantages they offered. However, various additional tasks have been established recently in addition to the firm plans. Frequent and unsound changes in the plan have become rather widespread in use. There have been many instances wherein the rayon agricultural administrations have provided the farms with a structure for their areas under crops which is not in agreement with the crop rotation plan being used by them. In animal husbandry, increases often take place in the number of livestock on the farms although the areas used for forage crops remain the same. Indeed, at times

there may even be a decrease in forage crop plantings as the result of a simultaneous and planned increase in the sowings of grain crops. As a result, the number of livestock increased while their productivity decreased.

All of these factors served to lower the mobilizing role played by the plan and they adversely affected the rational organization of production and economic activity and also the development of initiative among the farm leaders and highly skilled specialists. The plurality of plans and the changes in them aimed mostly toward increases subsequently precluded the possibility of obtaining raised prices for the products sold and this instilled in the kolkhoz and sovkhoz leaders a desire to set the prices too low. In a number of instances, this led to a real lowering of the production volume.

In conformity with the decree of the CC CPSU and the USSR Council of Ministers entitled "On Improvements in Planning and Economic Incentives for the Production and Procurement of Agricultural Products," instead of a plurality of planned tasks for 1981 the kolkhozes and sovkhozes were provided with unified plans for the procurement of agricultural products for the five-year plan, with a breakdown by years. Moreover, special attention is being given to improving the use of land, productive capital and logistical and labor resources, to employing a differentiated approach for the republics, krays, oblasts and rayons and for each kolkhoz and sovkhoz and to taking into account more completely the production trends and the natural and economic factors.

In addition to the unified plans for the procurements of agricultural products, the farms will be provided with other indicators. However, the number of these indicators will be strictly limited. From above, the farms will be supplied with a definite amount of equipment, mineral fertilizers, chemical agents for protecting plants and other important logistical resources and for the sovkhozes and other state agricultural enterprises and associations, in addition -- a wage fund (normative), profit plan, the placing in operation of fixed capital and limits for capital investments and construction-installation work.

Other indicators such as the volume of output production, the size and structure of the areas under crops, the numbers and productivity of the livestock, cropping power of the agricultural crops, forms for the organization of labor and the social development of the rural areas must be developed directly on the farms by the leaders and specialists assisted by the social organizations. Thus the number of indicators approved for the farms is being reduced mainly as a result of the establishment of a unified plan for state procurements, which is promoting an expansion of their rights in the sphere of planning for production and its technology and organization. This is opening up additional opportunities for uncovering new reserves for raising the efficiency and quality of work.

Taking into account the tremendous importance being attached at the present time to the problem of social development of the rural areas for improving agricultural production, it is considered advisable to ensure that the farm plans include sections for the social development of the rural areas. These sections should call for measures aimed at improving working conditions, raising the skills and professional expertise of workers and their general educational and cultural levels and improving housing and cultural-domestic conditions.

The successful solving of the problem of intensification of agricultural production and raising its efficiency assumes further improvements in the system of economic incentives. Based upon decisions handed down during the March (1965) and subsequent Plenums of the CC CPSU, the implementation of measures aimed at improving economic incentives in agricultural production has created important prerequisites for the establishment of a relative equivalence in inter-branch exchange and more favorable conditions for expanded reproduction at the kolkhozes and sovkhozes. For example, in 1979 the monetary earnings of kolkhozes and sovkhozes for products sold to the state increased by more than a factor of 2.4 compared to 1965, against a growth in gross agricultural output during these years of 55.6 percent.

Further improvements in the system of issuing economic incentives for increasing the production and sale of agricultural products to the state and raising production efficiency continues to be one of the principal problems of the party's modern agrarian policies. The development of the system of economic incentives derives from the peculiarities of the modern stage of agricultural development, the emphasis placed upon achieving high final results, raising the efficiency of social production based upon accelerated scientific-technical progress and upon strengthening the role played by the intensive factors of development. During the 26th CPSU Congress, L.I. Brezhnev emphasized that one mandatory input for efficiency is that of achieving further improvements in the economic working conditions of kolkhozes and sovkhozes.

In the interest of improving the system of issuing incentives to farms and in connection with the establishment of unified plans for procurements, new procurement prices were established and placed in operation in 1981. These new prices include the bonuses paid out earlier for above-plan sales to the state of grain, sugar beets, raw cotton, potatoes, livestock and poultry, milk and other products. The total amount of bonuses included in the basic prices comes to roughly 3.6 billion rubles, as a result of which their overall level increased somewhat.

The councils of ministers of the union republics, by agreement with the USSR Goskomtsen [State Price Committee], are ensuring that the largest amount of funds allocated to them is used for raising the procurement prices for low profitability or unprofitable products such as, for example, milk, large-horned cattle, swine, potatoes, sugar beets and others. Some republics used the sums allocated for improving the zonal differentiation of prices. Thus, in the Latvian SSR the differentiation of prices by administrative rayons has been replaced by differentiation according to farm groups, depending upon their territorial location*. The new procurement prices call for incentives to be issued for the production of high quality agricultural products.

It bears mentioning that the inclusion in the basic procurement prices of the amounts formerly paid for products sold over and above the plan has made it possible not only to maintain the earnings prevailing in the union republics but also to realize improvements in the ratio of prices for individual types of products and in the conditions for obtaining such products. The bonus included in the price will be obtained not only by those farms which supply agricultural products over and above the established firm plans, as was earlier the case, but by all farms.

* See EKONOMICHESKAYA GAZETA, No 6, 1981 p 9.

In order to increase the issuing of incentives to kolkhozes and sovkhozes in the future and raise the production and sale of agricultural products, commencing in 1981 bonuses were established in the amount of 50 percent of the procurement prices, for the sale to the state of products over and above the average annual sales level achieved during the Tenth Five-Year Plan. Moreover, this level remains unchanged for determining the amount of output for which a bonus will be added to the prices during 1981 and subsequent years of the Eleventh Five-Year Plan. Bonuses will be paid for the sale of grain, sunflowers, raw cotton, flax and hemp, livestock and poultry, milk, wool and others.

It must be emphasized that this basically new system for issuing incentives encourages the farms to achieve high final results and to achieve maximum possible growth in the production of specific types of products. Whereas the bonuses for above-plan output objectively encouraged the kolkhoz and sovkhoz leaders to carry out their planned tasks, the new bonuses serve to encourage those farms which employ all of their new reserves for constantly increasing their production and sale of products to the state. In view of the fact that the average level achieved during the years of the Tenth Five-Year Plan for selling products to the state, owing to unfavorable weather conditions, was relatively low for three of the five years and it was precisely this level which served as the basis for establishing the 50 percent bonuses added on to the procurement prices. During the Eleventh Five-Year Plan, the amount of bonuses paid out for above-plan output will be substantial. The introduction of this new system will promote greater initiative in farm leaders and specialists and the implementation of important work associated with defining more precisely existing farm specialization and the development of more rational specialization. During 1981 the farms will receive 4 billion rubles worth of additional funds in the form of bonuses.

"Success for all of the plans and all of the programs" emphasized L.I. Brezhnev during the 26th CPSU Congress, "is dependent upon the attitude displayed towards the work, upon conscientious work being performed by the agricultural workers and, it follows, upon the system established for issuing moral and material incentives." The requirement for increasing the issuing of material incentives to agricultural workers has been carried out in a constant manner. Thus, during the 1965-1979 period the payment for one man-day at kolkhozes and sovkhozes was raised by a factor of two and amounted respectively to 5.35 and 6.36 rubles. At the same time, the wage system in effect at the kolkhozes and sovkhozes was excessively complicated and the wage level was not coordinated with the final results of economic activity or with the indicators achieved for production efficiency. The measures called for in the decree for stimulating labor are making it possible to coordinate wages more closely with the final work results and to generate more interest among the agricultural workers in increasing their production of goods.

The measures outlined for improving the issuing of incentives to plant and animal husbandry workers and to leading workers and specialists are aimed primarily at stimulating the attainment of high quality production indicators which describe the efficiency of production operations, indicators such as improved labor productivity, reduced output production costs and growth in the production of goods compared to previous years. Special measures are called for in order to stimulate the production of high quality feed, raise the cropping power of crops and the productivity of animals, improve the quality of output and other operational indicators.

The system employed for the formation of material incentive funds at sovkhozes and other state agricultural enterprises has been changed. Whereas earlier the amounts for the material incentive fund were established depending upon the profit obtained and thus they were limited to 12 percent of the wage fund of enterprises, in conformity with the new decree of the CC CPSU and the USSR Council of Ministers the formation of the material incentive fund, commencing in 1981, is carried out on the basis of stable norms and depending upon an increase in output production and the profit obtained (reduced losses). Thus this fund is formed on the basis of two indicators: according to a norm established in percentages of the profit, for each percent of increase in the production volume for gross agricultural output compared to the average annual level achieved during the preceeding 5 years, and also according to the norm established for obtaining profit. These changes in the method for forming the material incentive fund are serving to raise the interest of production collectives in improving their labor productivity.

The decree brought about substantial changes in the conditions for issuing wages and bonuses to workers at sovkhozes and other state agricultural enterprises and it raised the interest of labor collectives in accelerating growth in labor productivity, particularly on the basis of developing the brigade form for labor organization and introduction of the Shchekino method. The collectives of production brigades are authorized, within the limits of the approved norms and funds, to establish the amounts of the bonuses and wages to be paid for the work results of the brigade's entire collective, taking into account the real contribution made by each member of the brigade to the overall work results, to determine the winners of the socialist competition within the brigade and the amounts of their incentives and to nominate from among the members of the brigade the candidates for material and moral incentives, based upon the results of the intra-farm socialist competition.

The measures undertaken are creating a firm foundation for developing progressive forms for wages paid out for the final results of labor and they are serving as a powerful stimulus for quantitative and qualitative growth in the mechanized teams and detachments, which operate according to the non-order system (job contract plus bonus with time-rate advancement of pay). Practical experience underscores the fact that collective wages paid out on the basis of final results and not for the volume of work carried out is the most effective form for stimulating labor.

The experience of farms in various zones of the country reveals the advantages possessed by non-order teams in the growing of certain agricultural crops. As a rule, for such teams and assuming the same production conditions, the cropping power is considerably higher and the material and labor expenditures for the production of each quintal of product are lower than in conventional brigades. For example, on farms in Millerovskiy Rayon in Rostovskaya Oblast, where non-order teams work approximately 80 percent of the arable land, for an increase in the cropping power of the crops the labor expenditures for output production are 20-23 percent and production costs -- 15 percent lower than the average for the rayon*. A savings is achieved in material and labor expenditures owing to the fact that the wages of the machine operators and all workers belonging to a team are directly dependent upon the quantity and quality of output.

* See SEL'SKAYA ZHIZN', 26 Dec 81.

At the same time, a number of conditions in the existing wage system have failed to create sufficiently high interest among the sovkhoz workers in increasing the production of goods and the profits of farms, raising labor productivity or utilizing internal reserves to the maximum possible degree and they have not stimulated the adoption of tense tasks. Thus, despite the high effectiveness of the mechanized non-order teams and brigades, this explains why for the most part they have not as yet entered into widespread use. According to data provided by the USSR Ministry of Agriculture, during 1980 they cultivated no more than 8 percent of the areas under crops*.

The system of measures called for in the decree for improving the material incentives issued for efficient labor, based upon more consistent implementation of the socialist principle of distribution according to the quantity and quality of labor, opens up broad opportunities for introducing into operational practice a progressive method for organizing and issuing payments for labor -- work carried out according to the non-order system. This will create at the same time important prerequisites for achieving more complete use of the labor potential of kolkhozes and sovkhozes.

The shortcomings which have developed in rural construction and in the logistical supply system for this branch are well known, with the logistical supply requirements not always being coordinated with the procurement volumes planned for the agricultural products. In particular, one principal shortcoming lies in the fact that the plans for capital construction are not being coordinated properly with the logistical resources allocated. Each year, more than 100,000 agricultural projects are being built, with use being made of more than 800 different standard plans. Of this number of projects, only approximately 3,000 of the larger construction projects, or roughly 3 percent, are being staffed with the required equipment on a centralized basis. Slightly more than 25 percent of the volume of capital investments intended for production and cultural-domestic construction operations in the rural areas is being employed for these construction projects**.

Substantial shortcomings exist in construction operations proper. First of all, there is the process of rising construction costs. At the present time, the cost for constructing one livestock billet for swine and large-horned cattle has increased by a factor of 3-4 compared to 1965. The fact of the matter is that with the existing system for planning the economic indicators for the activities of construction organizations and their stimulation, these organizations are not interested in using cheap structures or materials. The use of expensive materials and structures makes it possible, with reduced expenditures of labor, to achieve high indicators for labor productivity and obtain high income and bonus funds. It is for these reasons that contractual construction organizations are unwilling to carry out work associated with the modernization of existing enterprises. Compared to new construction, such work involves the use of fewer materials but requires greater labor expenditures.

The decree of the CC CPSU and the USSR Council of Ministers calls for a complex of measures aimed at providing logistical support for the planned tasks for procuring

* See EKONOMICHESKAYA GAZETA No. 9, 1981, p 23.

** See MATERIAL'NO-TEKHNICHESKOYE SNABZHENIYE No. 11, 1978, p 39.

agricultural products and for raising the effectiveness of use of the capital investments allocated for agriculture. Today, simultaneously with the plans for selling agricultural products to the state, the farms will be provided with capital investment plans, limits for contractual work, logistical support plans and financial-economic indicators. The appropriate ministries and departments of the USSR and the councils of ministers of the union republics are tasked with ensuring that the plans call for the kolkhozes, sovkhozes and other agricultural enterprises to be supplied, on a priority basis, with the material resources and equipment, the capital investment limits and the construction-installation and contractual work required for the modernization, technical re-equipping and expansion of existing enterprises.

One urgent task is that of reducing the losses in agricultural products, particularly highly perishable products. The extent of such losses is considerable and analysis has revealed that in recent years they have been increasing rather than decreasing. The urgency of this problem was pointed out by L.I. Brezhnev who, during the Summary Report by the CC CPSU to the 26th party congress, stated that "the volumes of products being produced by agriculture today are making it possible to improve noticeably the work of supplying the population with many types of food goods. During the past five-year plan, for example, the average annual consumption of vegetables and fruit per capita increased considerably more slowly than did their production. And the principal reason for this -- losses. Hence, while continuing to increase the production of fruit and vegetables, we must also improve their transporting, storage and processing."

The decree calls for a number of measures aimed at improving the preservation of all agricultural products produced. The plans call for converting over to procuring the agricultural products in the areas where they are produced, improving the system for accepting and paying for highly perishable fruit and vegetable products and expanding the direct contacts between the farms and trade organizations. The achieving of this goal -- reducing losses -- will promote the carrying out of measures aimed at expanding the volumes of fruit and vegetables processed directly on the farms. In this regard, the kolkhozes, sovkhozes and other agricultural enterprises operate under the same conditions for planning, logistical support and wholesale prices as apply at those industrial enterprises engaged in the production of goods from agricultural raw materials.

The implementation of the measures called for in the decree, for improving planning and economic stimulation, will exert a positive effect on growth in agricultural output during the new five-year plan and accelerate the rates of development for this branch. At the same time, the measures undertaken will obviously not be sufficient for solving all of the problems that have accumulated in the area of improving control over agriculture, nor will they ensure the achievement of the high absolute increases in the production of agricultural products as called for during the 26th party congress, particularly those types of products the shortages of which are causing interruptions in supply. "In the interest of achieving a radical solution for this problem" stated L.I. Brezhnev during the 26th party congress, "we consider it necessary to develop a special food program. It must ensure a considerable increase in the production of agricultural products. It must draw agriculture closer to those branches engaged in the storage and processing of its products.

And certainly to the trade organizations. In other words, its goal should be that of carrying out the task of supplying the population with a continuous supply of products as rapidly as possible."

The foundation for the food program will be further improvements in agriculture. In this regard, large capital investments have been allocated for its development during the Eleventh Five-Year Plan and this will make it possible to strengthen considerably the logistical base of the kolkhozes and sovkhozes. During the years of the five-year plan, the power-worker ratio at kolkhozes and sovkhozes will increase by a factor of 1.5 and the capital-labor ratio -- by a factor of 1.4. Increases will take place in the deliveries of new and highly productive equipment. This will all serve to promote an increase in the production volume for agricultural products, the per capita increase of which must be twice as high as that for the past five-year plan.

An overall approach for the development of agriculture and its related branches of industry, further improvements in the process of production intensification, conditioned by growth in the scales of use of logistical resources in agriculture, and the achievement of high final results in the form of constantly increasing volumes of agricultural output -- all of these factors assume improvements being realized in the mechanism of interrelationships and interaction among branches of the agroindustrial complex. For it was precisely in the "Basic Directions for the Economic and Social Development of the USSR During the 1981-1985 Period and for the Period Up To 1990," in the interest of successful implementation of the food program, that the task was assigned of "achieving unified planning and proportional and balanced development for the branches of the agroindustrial complex, considerable strengthening of its logistical base, improvements in the economic contacts between branches, the organization of efficient interaction among them in increasing the production of agricultural products and improvements in the preservation, transporting, processing and delivery of these products to the consumer." During the new five-year plan, almost one third of all capital investments in the national economy were allocated for the development and improvement of the country's agroindustrial complex.

In connection with the need for achieving an interrelated and balanced development for those branches forming the agroindustrial complex, one vital problem is that of improving the economic mechanism and production-economic collaboration among the branches of the agroindustrial complex and particularly collaboration between those branches which supply the agricultural equipment and agriculture proper. At the present time, the work of the supplier-branches is oriented mainly towards the overall goal -- maximization of the final product and the final results of the agroindustrial complex and achievement of the branch goal and growth in the cost accounting branch results.

Those branches which supply production equipment for agriculture are oriented towards the mass production of products which have already been mastered and which are economically profitable for them to produce. However, the true effect realized from the use of these products in the sphere of their production consumption is not reflected in the economic status of the producer. Agriculture is actually unable to exert a true influence upon the producer of the equipment being supplied to it, for the purpose of raising its quality and improving its structure. Thus the orders of

kolkhozes and sovkhozes for types of equipment, themass production of which has already been organized, are being fulfilled as a rule. At times, the new machines do not enter series production for a long period of time and they are often obsolete by the time they are being mass produced. Thus, according to data supplied by USSR Goskomsel'khoztekhnika, there are more than 140 types of machines required for agriculture which have already undergone testing and although the production of these machines was authorized several years ago industry is still not producing them.

A similar situation is being observed in connection with the production of products of the chemical industry, required for agriculture. According to data supplied by the USSR Ministry of Agriculture, owing to insufficient support in the form of pesticides, chemical weed control work in behalf of grain and cotton crops is being carried out on less than one half of the area sown in these crops, on one fourth of the sugar beet sowings, on one third of the vegetable crop sowings and so forth. By no means is the Ministry of the Chemical Industry carrying out fully its task of supplying agriculture with chemical protective agents. One hundred and forty four preparations have been recommended for use in agriculture and yet only 60 are being produced. Moreover, many of them have become obsolete. All of these factors are adversely affecting agricultural production and growth in its efficiency and productivity.

Another shortcoming which is restraining the introduction into agriculture of new scientific and engineering achievements is the unjustified growth in prices for the industrial means of production being supplied to this branch, prices which have overtaken the increase in their useful effect. This inevitably leads to a systematic increase in prices per unit of useful effect. Thus, during the 1966-1972 period alone, the price for a unit of power in a tractor pool having an appropriate set of machines increased by 83 percent, a unit of mixed feed -- by a factor of almost 1.63, applications of mineral fertilizers -- by a factor of 1.6, the cost for constructing a cattle billet for large-horned cattle -- by a factor of 2.3, and for swine -- by a factor of 4.5 and so forth*. Many branches of industry are taking advantage of their right to employ temporary prices for new types of products, with these prices becoming considerably inflated compared to the increase in useful effect obtained. This negative trend in inter-branch exchange has continued to manifest itself in recent years. It leads to growth in the production costs for agricultural products, to a reduction in the level of production profitability at the kolkhozes and sovkhozes and to a deterioration in a number of their indicators and this inhibits the carrying out of expanded reproduction at the kolkhozes and sovkhozes.

The need for solving these and other problems of inter-branch exchange was pointed out during the July (1978) Plenum of the CC CPSU, which obligated the appropriate organs, together with the scientific institutes, to undertake measures aimed at improving economic relationships between agriculture and those branches which supply it with the means of production and services. We are of the opinion that the successful realization of the assigned tasks assumes that solutions be obtained first of all for the following two fundamentally important groups of problems.

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* See "Narodnokhozyaystvennyy agropromyshlennyy kompleks. Teoriy i praktika." /National Economic Agroindustrial Complex. Theory and Practice/. Ekonomika Publishing House, 1980, p 130.

First of all, a system must be created for planning and the economic stimulation of inter-branch interaction in the agrarian sector of the economy, one which will orient all of its branches towards maximizing the final product and the final national economic results. Within the framework of this system, the intra-branch economic relationships must be developed taking into account the achievement of the required optimum economic results. Moreover, emphasis should be placed upon Lenin's statute that the "basic principle for the distribution of agricultural machines and so forth must be that of satisfying the interests of agricultural production and raising the productivity of agriculture"*.

An organic element of the mentioned system must be that of intensifying the influence of the consumer of the means of production upon the producer of such means.

This methodologically fundamental position was mentioned by L.I. Brezhnev during the 25th CPSU Congress: "Importance is attached not only to remembering that the final goal of production is that of satisfying certain social requirements, but also drawing practical conclusions from this fact. And one of these undoubtedly will be that of providing the consumer -- if we are speaking about raw materials, materials, machines, equipment or consumer goods -- with more extensive opportunities for influencing production." Unfortunately, the mechanism of reverse influence of the consumer of a product upon its producer has still not been worked out. It appears that improvements in the economic mechanism for inter-branch interaction are possible through the centralization of planned control over the agroindustrial complex as a whole, in which all of its elements are oriented towards achieving common and final national economic results.

The task of achieving a proper combination of economic interests for all branches participating in the production and sale of agricultural products, with these interests remaining subordinate to the national economic interests, requires the establishment of a firm system of price formation, with the prices for new products conforming to their final useful effect. We are of the opinion that those economists are correct who believe that departmental leaders should be deprived of the right to approve the prices for new equipment and that an inter-departmental and all-state arrangement should be created for this purpose. This is of special importance to those branches belonging to the national economic agroindustrial complex.

Under modern condition, further and successful development of agriculture will be determined to a decisive degree by the level of development of the country's entire agroindustrial complex and by its proportional and balanced development. A vital task continues to be that of achieving more efficient and rational use of the fixed productive capital available at the kolkhozes and sovkhozes, particularly the agricultural equipment. There have been frequent instances of crude violations taking place in the rules for the technical operation and storage of tractors, transport equipment, agricultural machines and equipment; this equipment becomes worn out and breaks down before its normal service life has expired. In this regard, the special decree adopted by the CC CPSU and the USSR Council of Ministers entitled "Additional Measures for Ensuring the Preservation of Equipment in Agriculture" calls for a complex of measures aimed at raising the level of

* V.I. Lenin. Complete Collection of Works. Vol 36, p 238.

technical operation and the quality of agricultural equipment repair work and for the construction of new garages and other facilities for storing tractors, transport vehicles and other agricultural machines and equipment.

"The Basic Directions for the Economic and Social Development of the USSR During the 1981-1985 Period and for the Period Up To 1990" call for the following to be carried out in agriculture "to achieve dynamic development and growth in the efficiency of all branches,,an increase in production and improved quality of of output. To continue the course aimed at comprehensive intensification of agricultural production." During the Eleventh Five-Year Plan, the average annual production of agricultural products must be increased by 12-14 percent. By achieving further improvements in soil fertility and in cropping power, the average annual production of grain will be increased to 238-243 million tons, including pulse crops -- to 12-13 million tons. Increases will take place in the production and procurements of rice, buckwheat, millet and strong and durum varieties of wheat. Public animal husbandry will be confronted by important tasks during the current five-year plan. As a result of improvements in the productivity of the livestock and poultry, the average annual production of meat will increase to 17-17.5 million tons (in dressed weight), milk -- to 97-99 million tons, eggs -- to 72 billion units and wool -- to 480,000 tons.

The implementation of the system of measures called for in the decree of the CC CPSU and the USSR Council of Ministers, for improving planning and the economic stimulation of agricultural production, will promote the successful solving of this task and exert a positive effect on the effectiveness of agricultural production and upon the labor activities of agricultural workers. The realization of the new statutes and requirements set forth in the decree will create important prerequisites for a more harmonious combining of the interests of individual workers with the interests of enterprises and the interests of kolkhozes and sovkhozes with the interests of the state. Improvements in planning and stimulation will increase the efficiency of agricultural production and serve as a prerequisite for further raising the material welfare of the Soviet people.

7026
CSO: 1824/390

TILLING AND CROPPING TECHNOLOGY

IMPORTANCE OF SEED FARMING OF CORN FOR GRAIN DISCUSSED

Moscow KUKURUZA in Russian No 4, Jul-Aug 81 pp 1-2

[Article by A.T. Slyusarev, deputy chief of Sortsemprom USSR: "Corn Seed Growing--Daily Attention!"]

[Text] In terms of the fundamental directions of economic and social development of the USSR for 1981-1985 and for the period to 1990, as affirmed by the 26th CPSU Congress, provision has been made to bring average yearly production of grain to 238-243 million tons.

In the solution of this task, a significant place belongs to corn. Production of its grain must reach 23-25 million tons. During the 10th Five-Year Plan, however, it was curtailed somewhat compared to the Ninth, but yield grew by 4 q/ha.

The harvesting area of corn for grain has been on an average annual basis 3 million hectares, although the soil and climatic conditions of our country, with consideration being given to economic need, permit the expansion of the grain area of corn to 5 million hectares.

The last few years have been extremely unfavorable in regard to weather conditions, with a significant deficit in the total of effective temperatures for the cultivation of this crop. At the same time, there also have been grown on quite significant areas midseason ripening and medium-late hybrids, which in many zones of the RSFSR and Ukrainian SSR did not ripen for grain.

The heads of many farms, in order to prevent losses in the yield of corn that had failed to ripen in optimum periods, harvested it for silage and green fodder. On the average for 1977-1979, more than 1.2 million hectares of such crops were harvested, including about 670,000 hectares in the Ukrainian SSR, more than 300,000 hectares in the RSFSR and 80,000 hectares in Moldavian SSR.

This was the consequence of serious miscalculations made by scientific-research institutions in breeding work, when the main attention was given to the creation of midseason ripening and medium-late hybrids and not enought to early and medium-early ripening ones.

The area with early and medium-early ripening hybrids practically has not increased. While in 1970, they took up 837,000 hectares, in 1980 the total was only 870,000 hectares.

Early and medium-early ripening hybrids mature stably for dry grain in the northern zones of corn growing, while in many southern rayons they are grown as a predecessor of winter crops. In recent years, areas with early ripe and medium-early ripe hybrids have not been expanded because of insufficient availability of their seeds for farms. Despite a need of 300,000 for first-generation hybrid seeds, 91,700 tons were procured for the 1979 sowing, 176,100 tons for 1980 and 125,800 tons for 1981.

In recent years as a whole, the requirement for corn seed has grown. Each year, seed procurement plans have been fulfilled, the requirement of kolkhozes and sovkhozes for seed has been completely satisfied, but quality of seeds has not improved. During this time, the relative share of second-generation hybrid seeds grew significantly (see Table).

The target for first-generation hybrid seed procurement has not been fulfilled by specialized seed farms in a single union republic.

Seed growing of corn in the RSFSR has significantly worsened. Whereas first-generation hybrid-seed procurement in 1977 amounted to 175,000 tons, in 1980 the figure was 96,000 tons. Fewer such seeds have started to be produced in Ukrainian SSR: in 1977--255,000 tons, in 1980--244,000 tons. A certain increase in the procurement of first-generation hybrid seeds has occurred in Moldavian SSR--from 29,000 to 49,000 tons, respectively and in Kazakh SSR from 39,000 to 59,000 tons.

Agricultural organs of the RSFSR, Ukrainian SSR and Georgian SSR have weakened control over the production of first-generation corn seeds; inadequate attention is being given to the agrotechnology of hybridization sectors, which lowers their yield. At hybridization sectors, there are produced on the average 10-11 quintals of seeds per hectare, while at the best experimental farms operating at a high agrotechnical level, the production is 2-2.5-fold greater.

This year, the growing of hybrid seeds must be maintained under daily control. The higher the yield attained at hybridization sectors, the smaller should their area be; because of this sowings of commodity corn should also increase. Today, hybridization and primary seed-growing sectors and also top-reproduction strain sectors occupy more than 20 percent of corn sowings for grain. Agricultural organs should include seed-growing sectors while taking into account the specific nature of work in the system of corn cultivation on the basis of industrial technology.

In conformity to the assignment, there should be produced in 1981 about 1,300,000 tons of corn seeds, including 874,000 tons of first-generation hybrids and 26,400 tons of parental forms.

The primary basis for the growing of commodity corn seeds is production of seeds of parental forms of hybrids--superelite and elite varieties. But many scientific-research institutions of the RSFSR, Ukrainian SSR, Georgian SSR and Azerbaijan SSR are chronically not fulfilling assignments as a whole, especially for individual self-pollinated lines and plain hybrids (parental forms).

Thus, in 1979, the Krasnodar Scientific-Research Institute of Agriculture fulfilled the target for production of seeds 81 percent, the Stavropol' Selection Experimental Station--80 percent, Voroshilovgrad Oblast Experimental Station--71 percent, Khmel'nitskaya Oblast Station--68 percent, Chernovitskaya OblastExperimental Station--60

Table.

Republic	Average annual procurement of seeds during 1977-1980, thousands of tons	Including: first generation, thousands of tons	percent	second generation, thousands of tons	percent
RSFSR	578.7	125.4	22	351.6	61
Ukrainian SSR	563.2	275.6	49	278.9	49
Uzbek SSR	26.7	11.1	41	14.8	55
Kazakh SSR	140.6	49.3	35	16.9	12
Georgian SSR	1.5	----	--	-----	--
Azerbaijan SSR	5.8	2.8	49	2.3	40
Moldavian SSR	67.4	42.6	63	23.4	35
Kirghiz SSR	20.6	11.9	57	4.0	19

percent and Zakarpatskaya Oblast Station--only 39 percent. This means that for many valuable hybrids there will not be established hybridization sectors on the required scale.

This year ministries of agriculture of union republics and heads of scientific institutions ought to take the necessary measures for fulfillment of targets for the production of seeds of parental forms of hybrids not only on the whole but also for each self-pollinating line.

In this connection, special attention should be paid to the preservation of high variety purity (typicalness) and sterility of maternal forms.

The practice of past years has shown that control is not being exercised by individual scientific institutions over the cultivation of these seeds; as a result seeds of low quality are being produced on many farms. Thus, at the Krymskaya Oblast Agricultural Experimental Station, the Krasnodar Experimental Station, the educational farm of the Kamenets-Podol'sk Agricultural Institute, the Komsomolets Seed Farm in Khar'kovskaya Oblast and others, seeds were grown in 1980 of some maternal sterile forms of hybrids, which under soil variety control produced an inadmissible quality for fertile plants. At the Chernovitskaya and Zakarpatskaya oblast agricultural experimental stations, the Komsomolets Seed Farm in Khar'kovskaya Oblast and others, they were in regard to type below the indicators provided by the seed standard.

High-quality seeds of parental forms, with observance of agrotechnical requirements at hybridization sectors, make it possible to grow hybrids with high potential possibilities.

Many scientific institutions violate prescribed procedure and, in agreement with kolkhozes and sovkhozes, locate on them sectors for the propagation of seeds of parental forms; at the same time they do not exercise control nor provide methodological aid in the production of these seeds. Agricultural organs need to require of such heads strict adherence to prescribed procedure.

Things are not going too well in connection with the creation of an insurance reserve of seeds of parental forms at scientific institutions. They do not exist at the majority of the institutions because they have not been producing seeds of the required lines due to unfavorable weather conditions. The production of valuable hybrids is also dropping.

In conformity with established procedure, scientific institutions, educational farms of VUZ's and tekhnikums should sell seeds of parental forms directly to specialized seed-growing farms producing first-generation hybrid seeds.

But most scientific institutions at the present time lack plants for treating seeds, for which reason they are forced to turn the seeds over to plants within the system of the Ministry of Procurement. Since each batch of seeds is of small volume, it is treated last, as a result of which the sowing qualities of the seeds are either reduced or are completely lost. Such a faulty practice should be decisively abandoned.

In recent years, kolkhozes and sovkhozes have had significant complaints in regard to the quality of corn seeds obtained from the processing plants. A significant reduction is occurring in the output of calibrated and certified seeds at plants processing them within the system of the USSR Ministry of Procurement. Thus, of the seeds procured during 1977-1980, the output of calibrated seeds for the republics comprised 65-70 percent, which is significantly below the norm and of certified seeds--even less. Actually, at the present time the drying capacity of plants for processing of seeds does not allow them to be dried in 25-30 days as is required, but much depends on the heads of the farms and plants. Coordinated schedules of harvesting and delivery to plants of seed ears of corn are either not compiled or are crudely violated. Harvesting starts very late, especially on the farms of Ukrainian SSR and Moldavian SSR; motor transport for hauling the ears is assigned last in order.

Agricultural organs must take into consideration these errors. They should think through all the segments of the process of harvesting, transportation and drying of the ears for the purpose of preserving the corn seeds.

Much work still remains to be done in connection with the further concentration of corn seed growing. At the present time, seeds of parental forms are being produced by 130 experimental-production farms of scientific-research institutions and educational-experimental farms of VUZ's and tekhnikums; on the average each produces 200 tons of seeds. Hybrid and strain seeds are grown by 2,301 specialized seed farms; of these, each farm produces on the average about 550 tons of seeds.

Such a level of concentration of production of corn seeds does not meet modern requirements. In Georgian SSR, on the average only 45 tons of seeds for one farm, in Moldavian SSR--340 tons, Ukrainian SSR--500 tons, Uzbek SSR--400 tons. Only in Kazakh SSR, their production reaches about 3,000 tons for a farm.

With fulfillment of the program of development of the material-technical base for corn seed growing as determined by the decree of the CPSU Central Committee and the USSR Council of Ministers (1978) "On Further Improving Selection and Seed Growing of Corn," it is essential to carry out its further concentration. Over the long term, the production of hybrid and strain corn seeds is planned to reach on the average 1,000 tons for a farm.

Abroad in recent years, seeds of corn and other crops have been treated on a wide scale with a film-forming solution. This method has come to be called seed incrustation (different dyes can be added to the solution). In our country serious research on this question has been conducted at Moscow Agricultural Academy imeni K.A. Timiryazev (the hydrophobization method) and the Ukrainian Scientific-Research Institute of Plant Growing, Selection and Genetics imeni V.Ya. Yur'yev (incrustation method). Incrustation of seeds makes it possible to stably retain chemical weed and pest killers, microfertilizers and other additives on seeds, which reliably protects them from pests and does not chemically contaminate the environment while improving the sanitary conditions of labor.

One of the immediate tasks of our scientific institutions is the development and testing of new economically gainful solvents, combinations of toxic chemicals and fertilizers and transition in the immediate years ahead to a new technology of seed treatment.

The most progressive form of organization of seed growing is to be found in scientific-production and production associations: Gibrid Scientific-Production Association in Moldavian SSR and Kuban'gibrid SPA. The association includes a scientific institution which produces seeds of parental forms of hybrids and exercises methodological supervision over seed growing; plants for treatment of seeds of parental forms and and hybrid seeds of corn, specialized seed farms.

Such an organization makes it possible to have a completed production cycle of high-quality corn seeds and provides the possibility of introducing into the technology the segment "field--plant" in which seed corn ears are harvested with combines with initial cleaning of the husks and then sent on motor vehicles to the plant for treatment of the seeds.

Within the system of the USSR Ministry of Agriculture, there are to be built during 1981-1985 additionally in accordance with the decree plants for treatment of hybrid corn seeds as well as seeds of parental forms. At the same time, conditions are being created for the organization of new production and scientific-production associations for seed growing.

A comprehensive solution of the problems of seed growing would make it possible to provide kolkhozes and sovkhozes each year with high-quality hybrid corn seeds of the intensive type.

7697
CSO: 1824/410

FORESTRY AND TIMBER

SHIFTS IN REGIONAL ORGANIZATION OF IRKUTSKAYA OBLAST FOREST INDUSTRY

Moscow GEOGRAFIYA I PRIRODNYYE RESURSY in Russian No 2, Apr-Jun 81 (manuscript received 15 Oct 80) pp 90-99

[Article by E. A. Medvedkova and G. I. Malykh, Institute of Geography of Siberia and the Far East of the Siberian Branch, USSR Academy of Sciences, Irkutsk: "Advancement in Territorial Organization of Forest Industry in Irkutskaya Oblast"]

[Text] In the assimilation of forestry resources of Siberia in recent years, in addition to bringing more of them into national economic circulation, more and more attention has begun to be devoted to their efficient utilization which makes it possible to provide for successful reproduction in the future. This is the plane on which problems of the forestry industry were considered at the all-union conference entitled "The Development of Productive Forces of Siberia," which was held in June, 1980 in Novosibirsk. In this connection, an economico-geographic analysis of the changes in the development of the forestry industry of Irkutskaya Oblast during the past 10-15 years is of a certain amount of interest.

Irkutskaya Oblast plays an important role in the country's forestry industry. It produces 8 percent of the union-wide volume of timber procurements. There are enough timber raw material resources so that the rates of these procurements can be considerably increased. The oblast's timber supplies amount to more than 8 billion cubic meters, approximately 70 percent of which are mature and overmature, consisting mainly of conifers [1]. The exploitation of these areas in taking place in stages as they become accessible during the process of economic assimilation of the territory. Additionally, in the regions that have long been assimilated the volume of timber procurements is decreasing or they are being entirely curtailed. The specific nature of the resource (timber), which is quickly exhausted in this locality and is not quickly renewed, determines the large spatio-temporal changes in the territorial organization of the forestry industry. A special article has been devoted to a detailed analysis of this [2]. These changes are a typical feature of the forestry in the Irkutskaya Oblast.

To study the dynamics of the previous assimilation of forests, we applied the method of grid squares which is based on a comparison of the volumes of procurements on certain dates throughout a long period, and also the centrographic method, which discloses the main directions of territorial changes in the distribution of timber procurements [3]. These methods made it possible to trace the dynamics of the process of the assimilation of forests during 1938-1968.

Using the aforementioned methods in this article, we analyzed the changes in the distribution of timber procurements during the period of 1969-1978. Moreover, attention was devoted to certain new phenomena in the territorial organization of the forestry industry.

The volume of timber procurements increased sharply in Irkutskaya Oblast beginning in the middle 50's. In 1938 the export of all timber amounted to 3.2 million cubic meters, in 1958--16.2, in 1965--24.5, and in 1975--32.5 million cubic meters [4]. Moreover the regions of concentration of production changed. In 1938 they included the timber areas near the Transsiberian railroad and by 1958 the main regions of timber procurement were the same. But at the same time there were new timber procurement regions along the route of the Tayshet-Lena railroad. During the period of 1959-1968 the construction of the Gratskaya GES brought about the development of timber areas in the channel of the Bratsk water reservoir and in the zone it encompassed, and work was started for timber felling and processing in the zone of the Ust'-Ilimsk water reservoir. This laid the basis for industrial forestry in the basin of the Lena river.

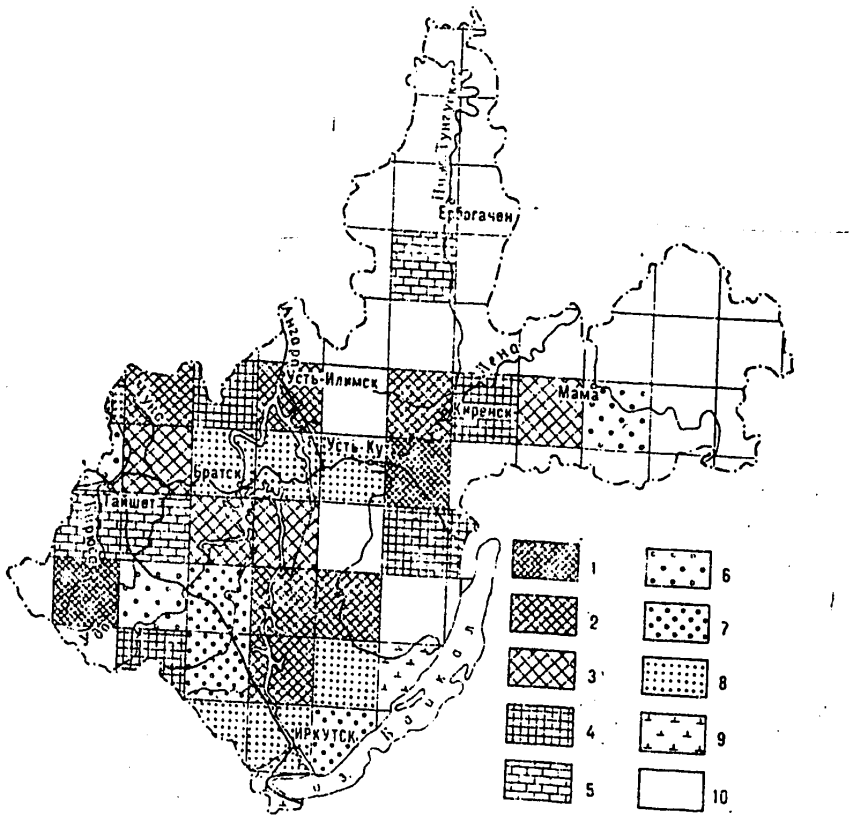
The period of 1969-1978 is characterized by more uniform distribution of timber procurements throughout the territory of the oblast. In regions of intensive assimilation the volumes of timber procurements decreased somewhat, mainly because they shifted to newly assimilated places. In the oblast as a whole timber procurements increased at slower rates. While during the preceding decade (1959-1968) the export of timber increased by 11.9 million cubic meters (73.4 percent), in the next decade they increased by only 3.5 million cubic meters (12.5 percent).

The dynamics of timber procurements investigated in terms of grid squares clearly reflect these changes. In order to compare the results, we used the same network of grid squares, where the area of an entire grid square is 14,400 square kilometers [3]. In order to determine the volume of felled timber in each grid square, we used points to indicate the locations of timber procurements in keeping with the distribution of the centers of the enterprises. The number and "weight" of the points change in the process of the branch's development. During the time that lapsed from 1938 through 1978 the number of points increased from 74 to 399, and in 1978 there were 49 more of them than in 1968. There was a marked change in the ratio between points and "weight." Because of the increased capacities of the enterprises the number of points with a "weight" of more than 250,000 cubic meters doubled (from 32 to 64). But, as before, there were more points with a small "weight"--from 0.1 to 10,000 cubic meters (198 points) and from 10 to 100,000 cubic meters (68 points).

The research showed that the period of 1968-1978 differed essentially from the preceding one (1958-1968). Although the grid squares where procurements increased occupied first place in the overall volume of timber procurements, their proportion decreased from 60.2 percent in 1968 to 51.8 percent in 1978. At the same time there was a considerable increase in the number of grid squares in terms of the area and volume of procurements where the amounts of felled timber decreased. They accounted for 24 percent of the forested area in the oblast in 1978 as against 7 percent in 1968. There appeared a group of grid squares in which timber procurements were curtailed. The area that was brought into operation for a second time decreased by half. A more detailed description of the changes in the development

of the forestry industry on the territory of the oblast is provided by an analysis of them in 1968-1978 (Figure 1).

Figure 1. Changes in Volumes of Timber Procurements During 1968-1978



Key:

Increased volumes:
1. 5-7-fold
2. 1.5-2.5-fold
3. Insignificant
4. New procurements
5. Volumes stable

Reduced volumes:
6. by 30-50 percent
7. by 50-80 percent
8. by 80 percent and more
9. Procurements curtailed
10. No procurements

It is typical that the greatest increase was observed along the BAM [Baykal-Amur Mainline] route and in the upper reaches of the Biryusa River (5-7-fold). There was a fairly significant increase in the zone affected by the upper part of the Bratsk water reservoir, the upper Lena and the middle reaches of the Chuny River. Here one can also find grid squares in which timber procurements were begun. This is the territory that reaches toward the western section of the BAM and also the upper reaches of the Iya and Oka rivers and in the basin of the Kova River (a tributary of the Angara).

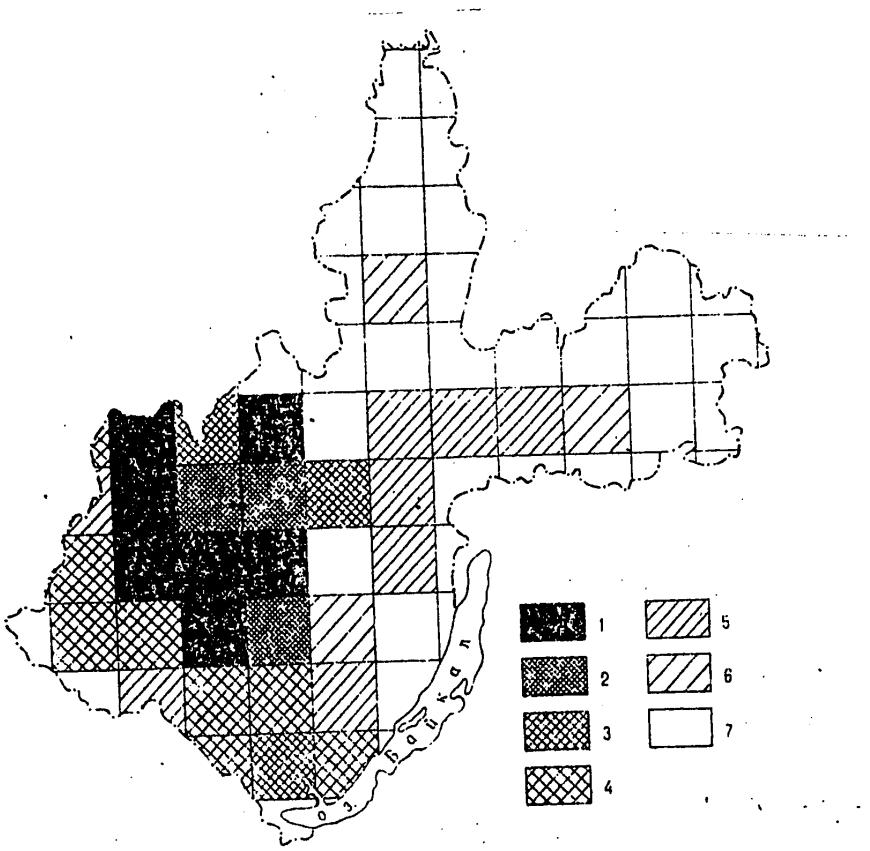
The volume of procurements has decreased on a considerable part of the territory of the oblast (23.8 percent). These are old timber operation regions where the timber raw material base has been exhausted. There has been an especially marked reduction in procurements in the zone of the Transsiberian Railroad, in the water protection zone of Lake Baykal, and along the central and eastern parts of the Lena railroad. Nonetheless, one-third of all the oblast's timber is procured in these territories.

The reduction of the procurement volumes was brought about by the establishment of their optimal amounts in order to provide for efficient forest utilization. This same problem is resolved by stabilizing the volumes of felling. Thus in the process of extensive exploitation, beginning in 1958 the volumes of procurements became stable in parts of the Uda and Biryusa basins which reach toward the Transsiberian Railroad. In the Biryusa basin their amounts are maintained at a level of 1 million cubic meters, and in the Uda basin--2.5 million cubic meters. Timber procurements are also stable in the basin of the lower Tunguska which is remote from economic centers and the main transportation routes. They produce timber only for local needs and the amounts do not exceed 100,000 cubic meters. Thus the stability of timber procurements in the aforementioned territories is brought about by various factors and differs sharply in scale.

One can obtain a general idea about the current distribution of timber procurements on the territory of Irkutskaya Oblast from a chart diagram on which the grid squares are marked in keeping with the absolute volumes of the timber shipped from within their boundaries in 1978 (Figure 2). As usual the western half of the oblast stands out. There the number of grid squares with the most intensive procurements (more than 2 million cubic meters) increased from 5 in 1968 to 7 in 1978.

While convenient for comparison on various dates, in some cases such map diagrams are conventional since the actual timber cuttings were not always in the grid square where the timber industry enterprise or timber point is located. This distance increases each year except in regions that are newly assimilated. Therefore the distribution of the points for calculation in the enterprise centers sometimes somewhat distorts the objective location of the cuttings. In recent years the Irkutsklesprom all-union timber industry association has been introducing the relay method of timber procurements which makes it possible to penetrate 100-120 kilometers into the areas. Therefore individual points can be located in the next grid square. But these distortions are insignificant so far since in 1978 26 relay sections produced only 4.3 percent of the overall timber procured by the association.

Figure 2. Volume of Timber Procurements in Irkutskaya Oblast in 1978
Quantity of Procured Timber (total, thousands of cubic meters)



Key:

1. more than 2,000
2. from 2,000 to 1,500
3. from 1,500 to 1,000
4. from 1,000 to 500
5. from 500 to 100
6. Less than 100
7. nore procurements (shipments)

The progression of the movement in the distribution of timber procurements can be determined by the centrographic method which gives one point on a selected date. In this investigation the point is the center of the timber procurements. Taking into account work done previously, we obtained central points of timber procurements on four dates--1938, 1958, 1968 and 1978 (Figure 3). Having shifted by 1978 from the region of the Ust'-Uda to the region of the lower Bratsk, the center of timber procurements in the oblast remains there now; its position has changed, but not significantly.

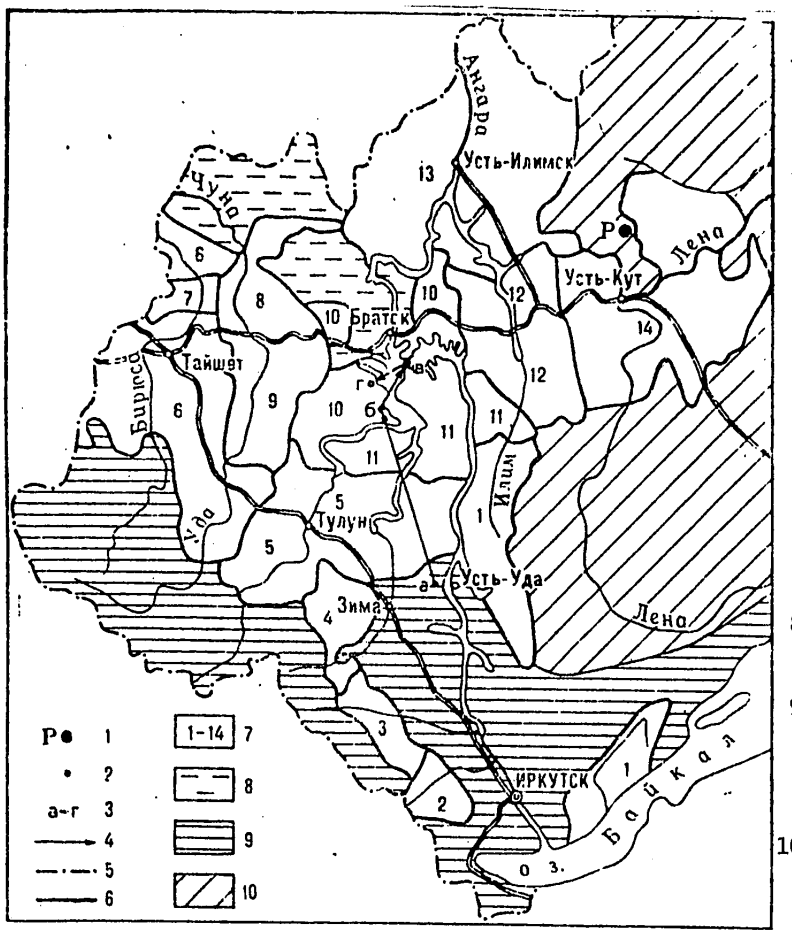
During 1969-1978 the distances of the movement of the center of timber procurements and the speed of this change were not great and approach the parameters of the preceding period. A certain shift to the southwest (instead of the expected one to the northeast, the direction of the shift during 1959-1968) shows fuller utilization of timber cuttings from previously assimilated regions and those adjacent to them. Because of the beginning assimilation of forests in the upper Lena regions, the center of timber procurements is expected to shift to the northeast. Here, north of the city of Ust'-Kut, is the center of timber resources determined by the centrographic method as compared to the timber supplies in 1969. Therefore it is quite correct to expect that after the year 2000 this will be one of the main timber procurement regions of the oblast.

The specific nature of the timber industry, which functions on a broad territory and includes hundreds of enterprises, requires constant improvement of the system administration. From the moment of the organization of the first timber industry enterprises, the forestry industry of the oblast has traversed a complex path of formation, and the capacities and territorial organization of the enterprises as well as their departmental jurisdiction and forms of association have changed. The reorganization of the administration of the timber industry which took place in 1975 is very important. Its primary goal was to provide for efficient comprehensive utilization raw material resources. The production association, created on the basis of the separation of combines and the consolidation of timber industry enterprises, became the main unit. In the system of the Irkutsklesprom timber industry association, instead of five combines they have organized 14 timber procurement production associations (see Figure 3).

In previously assimilated regions the production associations are located in the basins of rivers for timber floating; in the sphere of administration each of them includes enterprises for timber procurements, timber transportation and timber processing. The Kitoyles, Bel'skles, Ziminskles and Tulunles timber procurement associations are like this. With a reduction of the volumes of timber procurements the corresponding processing capacities must operate local deliveries of timber and through fuller utilization of timber raw materials both on the felled areas and in processing at the enterprise. In new regions with surpluses of timber the associations are called upon to provide raw material for large timber industry complexes (Bratsk, Ust'-Ilimsk) using poor quality timber and firewood and processing it into industrial chips, pulp wood and other products.

The timber procurement production associations were created on the principle of maximum concentration of production so that with less expenditure of raw material it is possible to increase the profitability of production and provide for an increased output-capital ratio and increased labor productivity. This required the

Figure 3. Current Distribution of Timber Operations Areas and the Dynamics of the Timber Procurement Centers in 1939-1978



7. Territory and numerical order to timber procurement production associations:

   1. Irkutskles
   2. Kitoyles
   3. Bel'skles
   4. Ziminkles
   5. Tulunles
   6. Tayshetles
   7. Yurtinskles
   8. Chunales
   9. Lesogorskles
   10. Bratskles
   11. Vostsiblesosplav
   12. Khrebtovosles
   13. Ilimskles
   14. Lenales

8. Territory assigned to other departments

9. Territory inaccesible for felling or exhaused by fellings of previous years.

10. Forest areas for future assimilation

Key:

1. Center of timber raw material resources in 1969
2. Timber procurement centers
3. Dates when timber procurement centers were calculated: a - 1938, b - 1958, c - 1968, d - 1978
4. Direction of movement. Boundaries:
5. Irkutskaya Oblast
6. Irkutsklesprom timber procurement production associations

creation of associations on a compact territory. Thus in the Bel'skles association the timber raw material base where two timber industry enterprises procure timber occupies approximately 4,000 square kilometers. It is joined by timber floating routes along the Belaya River and its tributaries to the village of Tayturkaya where the association's head enterprise association is located--the Tayturkaya LDK. In 1965 850,000 cubic meters of timber were felled in the Belaya river basin and little more than half as much in 1976--452,000 cubic meters. In the Irkutskles association alone, the raw material base is located in two isolated areas that are remote from one another--in the basin of the Goloustnaya River, where it is intended to increase timber procurements gradually because of the territory's inclusion in the water protection zone of Lake Baykal, and on the right bank of the middle part of the Bratsk water reservoir, within the Ust'-Udinskiy and Osinskiy administrative regions which have good prospects for increasing procurements.

It is typical that in recent years timber utilization has become more comprehensive in Irkutskaya Oblast. When allotting locations for timber procurements, other uses of timber which are no less important than its use for raw material are taken into account: water and preserve protection, the nut industry, soil protection, and protective sanitation purposes. True, they frequently fulfill this role on areas that have already been severely damaged by timber procurements. A special role is allotted to water protection forests. Along 2,300 rivers of the oblast during the period under consideration forest belts were planted with different widths: from 30 to 150 meters along 2,100 small rivers up to 50 kilometers long; from 300 to 1,000 meters along medium-sized and large rivers; and in regions where fisheries are located--the widths were up to 3,000 meters. It is important to allot these both in regions that have already been assimilated and in future ones.

In terms of their purposes, these kinds of forests are mainly in group I. From 1966 through 1978 their area increased from 4.8 to 6.5 million hectares and the proportion of area covered by forest in Irkutskaya Oblast increased from 8.7 to 11.3 percent. Forests of group II, where there is limited felling, occupy a small area in the oblast, but it has increased from 0.5 to 0.7 million hectares. In forests of groups I and II the amounts of felling are minimal and are conducted mainly to increase the protective functions and to improve the quality of the composition of the plantings.

Most of the timber (93.7 percent) is felled in forests of group III, which occupy 87.5 percent of the forested area in the oblast. Mainly coniferous varieties are felled. Conifers make up 75 percent of the overall volume of procured timber and larches comprise 17 percent. The proportion of soft deciduous is insignificant (3.3 percent) and their procurements are concentrated mainly in the raw material base of the Bratsk LPK for industrial and fuel raw material.

As distinct from other raw material resources, timber resources can be restored, and therefore when they are utilized intensively it is especially necessary to do timber cultivation work, whose volume is increasing with each year. As the forests are restored, the area that is not covered by forest is being transformed into the category of forested areas. In Irkutskaya Oblast the forested area in 1978 was 104 percent of that in 1966. It reached 57.7 million hectares while the unforested area was 63.6 percent of the 1966 level (4.9 million hectares). Most of it is on burned areas.

In the past 10-15 years there have also been marked changes in the distribution of forest in terms of age categories. Since forest exploitation is carried out with mature and overmature planting, naturally, their proportion decreases while the proportion of younger forests increases. Thus the proportion of mature and overmature tree stands in the overall supply of plantings in the oblast decreased from 77 percent in 1961, when it amounted to 6.2 billion cubic meters [5] to 68 percent in 1978 (5.6 billion cubic meters). While the supplies of mature plantings increased by only 3.6 percent during 1966-1978, the supplies of young and medium-aged tree stands increased by almost 34 percent. Because of this there will be a successful renewal of the overall supply of plantings.

The various levels of economic activity in forests, depending on the overall assimilation of the territory and its location, determines the sizes of timber industry enterprises. In 1950 there were 20 timber industry enterprises in the oblast, in 1958--37, in 1968--45 and in 1978--51. In the assimilated regions their area amounts to 40,000-90,000 hectares, and in the unassimilated ones they are tens and even hundreds of times larger, reaching 9-14 million hectares.

The breaking up of timber industry enterprises takes place, as a rule, as the territory's transportation accessibility improves. Thus, because of the construction of the Baykal-Amur Mainline on the territory of the former Kazachinsko-Lenskiy timber industry enterprise with an area of 3 million hectares, the Magistral'nyy, Ul'kanskiy and Kazachinsko-Lenskiy enterprises were formed. Another factor in the breaking up of enterprises was observed in the south of the oblast. Because of conducting measures to restore severely disturbed forests from the Irkutskiy timber industry enterprise, the Shelekhovskiy was separated out at the beginning of the 1970's. This is a suburban area which has acquired various economic functions.

The timber resources in Irkutskaya Oblast are still great enough, especially if one compares the calculated and actual timber fellings as a whole. From the supplies of mature and overmature timber (5,633,000,000 cubic meters) the calculated timber felling annually allows the removal of 1.12 percent or 63.3 million cubic meters, of which conifers comprise 45.9 million cubic meters. Their actual utilization makes up half of the calculated timber fellings. But sharp regional differences are observed in the assimilation of forests, and these make it possible to have regular fellings in certain regions and incomplete utilization of the calculated timber fellings in others (see Table).

The intensiveness of timber utilization is increasing in the process of the branch's development. In 1951 the calculated timber felling of the oblast was utilized by only 7 percent, in 1962--by 33.6 percent, and in 1978--by 50.3 percent. The utilization of timber fellings from coniferous varieties is increasing especially rapidly; practically no soft wood was felled before the startup of the Bratsk LPK.

In old, long assimilated regions the amounts of timber procurements are still fairly great, but they are frequently achieved as a result of regularly exceeding the planned timber fellings. Thus in Tuluno-Ziminskiy Rayon, also within the consumer timber raw material base of the Bratsk LPT, the overfellings have reached 1 million cubic meters annually in recent years. In the Bratsk timber industry enterprise, which is the closest one to the LPK, almost twice as many trees were felled as was

planned. The felling of more trees than is planned is frequently accompanied by large losses of timber both in the places where it is procured and in various stages of processing, beginning with the lower storehouses. As a result of this, the preliminarily determined supply of timber, on the basis of which the time of operation of the timber industry enterprise is calculated, turns out to be exhausted much earlier. For example in the Bel'sheokinskoye LPKh, which is a part of the consumer timber raw material base of the Bratsk LPK, because of inefficient utilization, the timber will be assimilated 20 years earlier than planned. This situation has arisen at other timber industry enterprises of this base as well. The Bratsk LPK which consumes 5.6 million cubic meters of timber a year is already experiencing a shortage in the deliveries of raw material.

But this is not the only difficulty in supplying timber to large consumers. In the forests that are the raw material zone of timber industry complexes, in addition to timber industry enterprises of the USSR Ministry of Timber Industry there are, as a rule, dozens of small timber procurement enterprises that export timber without processing to regions of the country that do not have as much timber, and thus they undermine the raw material base of the complexes that are operating for long periods of time. Attention was drawn to this in the central press as early as the beginning of the 1970's [6]. In the past decade the distribution of the timber supply has been regularized in favor of the basic large timber procurement organizations which, in Irkutskaya Oblast, are the timber industry enterprises of the Irkutsklesprom association. In 1978 they obtained 60.4 percent of the overall volume of fellings; almost 30 percent went to union and republic ministries; and more than 6 percent went to small independent procurement organizations. As compared to 1968, the proportion of enterprises of the USSR Ministry of the Timber and Wood Processing Industry increased by 2.6 percent; the proportion of union and republic departments decreased by 1 percent; and the proportion of small independent procurement organizations decreased by 3.6 percent.

The need for economical utilization of the timber raw material base in Irkutskaya Oblast arises from many natural and economic peculiarities, both of the oblast itself and of the territories adjacent to it. In the first place, under Siberian conditions trees grow extremely slowly and therefore the time period for restoring industrial supplies is very long--approximately 100 years. In the second place, new timber industry complexes are being created in Irkutskaya Oblast (the Ust'-Ilimskiy is under construction, the Verkhnelenskiy is being planned and the Chunskiy LPK has long been on the verge of completion), which will become the largest consumers of timber for many decades. In the third place, and it is especially important to take this into account in planning for the distant future, toward the north and east of Irkutskaya Oblast the quantity and quality of timber resources decrease sharply, and therefore they provide extremely limited possibilities of increasing the country's timber procurements.

Thus in the description of the natural conditions of the zone surrounding the BAM it was pointed out that the productivity of the phytocenoses changes from 60-75 quintals per hectare in the southern taiga forests toward the northwest of the Tayshet-Bratsk line and 45-60 quintals per hectare in the low mountain coniferous and soft wood forests in the region of Ust'-Kut (Irkutskaya Oblast) to 30-45 quintals per hectare in the sparse Gol'tsy soft wood forests and 15-30 quintals per hectare in the mountain tundra which is located in the north of the Buryatskaya

ASSR and Chitinskaya Oblast [7]. While in Irkutskaya Oblast the average supply of plantings amounts to 155.0 cubic meters per hectare, in the Buryatskaya ASSR it is 119.4 and in Chitinskaya Oblast--only 98.7 cubic meters per hectare [1]. Moreover, from the west to the east there is a sharp reduction in the proportion of conifers in the forest, the variety of trees that is used most widely in the national economy.

In the past 10-15 years there have been essential changes in the transportation of timber, which is directly related to the territorial organization of timber procurements. Since the beginning of the 1930's and up to the end of the 1960's the development of the timber procurement industry in the oblast has been connected to a significant degree to the utilization of timber floating rivers. The new tendency is this: to stop free floating of timber on rivers, to clear the sunken logs out of the branches of rivers, and to ship timber from the felled areas to the lower warehouses of the timber industry enterprises or directly to the consumers on trucks. During the period of industrial timber procurements in the oblast 47 rivers with an overall distance of 5,100 kilometers were used for floating. By 1978 the number of rivers used for timber floating was decreased to 24 and the volume of free floating of timber decreased from 5.1 million cubic meters in 1958 to 4.6 million cubic meters in 1977 [8]. But the curtailment of free floating of timber along rivers (which is extremely necessary for the protection of water and fish resources) is still taking place extremely slowly. In addition to free floating of timber, timber rafting along water reservoirs is very important in the oblast. It is still an important way of transporting timber and will be in the future. The volume of this kind of transportation increased from 2.7 million cubic meters in 1958 to 6 million cubic meters in 1977 [8].

The elimination of free floating of timber is planned as the planned network of timber roads which can be used year round can be put into operation. So far there are not enough of them. At the present time the timber industry in the oblast uses 32,800 kilometers of roads for various purposes, 60 percent of them for timber management and timber transportation and the rest for general purposes. In the timber industry enterprises of the Irkutsklesprom association in 1978 the distance of timber shipment roads amounted to about 8,000 kilometers, of which 3,500 kilometers could be used year round. More than 500 kilometers of timber shipment roads are being put into operation here annually, but because of the development of timber procurements on assimilated areas, almost as many become unusable. On the whole from 1971 to 1978 the distance of timber shipment roads in the association increased by 1,500 kilometers. With the use of large-cargo truck trains it is especially important to increase the number of roads that can be used year round. There has only been a marked increase in them since the beginning of the 1970's--from 28 percent of the overall distance of roads in 1971 to 44 percent in 1978.

Because of the continuously developing public production, its industrialization, urbanization and the critical problems of the protection of the environment, timber utilization in the oblast, despite the predominant role played by timber raw material, is increasingly acquiring multi-purpose functions. Under modern conditions in Siberia it is becoming a specific feature of the branch to provide for continuous utilization of the forests. The development of the industry in the Irkutskaya Oblast in the next 10-15 years (up to the beginning of the 1990's) can be marked by the appearance of new features in its territorial organization, some of which have been earmarked for the period that is being investigated.

Table. Differences Among Timber Operations Rayons of Irkutskaya Oblast in Terms of Their Forest Area and Its Utilization

Rayon	Rayon's proportion		Ratio between actual and calculated fellings	
	Forest area	Volume of procurements	All species	Conifers
Irkutsko-Cheremkhovskiy	5.2	8.8	63.1	84.9
Tuluno-Ziminskiy	4.3	10.2	95.9	129.7
Tayshetsko-Chunskiy	13.2	29.8	62.6	91.8
Bratsko-Ilimskiy	15.0	42.7	68.3	98.9
Prilenskiy*	62.3	8.5	13.4	16.0
Total	100.0	100.0	50.3	67.5

*Including the Lower Tunguska basin

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