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## PRESENT STATE, EFFECTIVENESS AND PROSPECTS OF SUNFLOWER PRODUCTION IN THE PEOPLE'S REPUBLIC OF BULGARIA

At present the main task of sunflower production in Bulgaria is the increase of total sunflower output from the same acreage reached in the period of 1971-1975. For this purpose right distribution of the crop in the regions is necessary as well as improvements of its managerial practices.

In 1971-1975 the mean annual acreage amounted to 251,092 hectares, the yield - 17 c/ha, the production costs were 2.98% of the total costs in crop production, including 4.14% of material costs and 1.98% of labour costs. During the same period the total sunflower output was 4.90% of the total crop production, the gross income was 5.00% and the net income 11.15% of net income of the national crop production. In 1960 sunflower was grown all over the country except Smolyansky district. Soil and climatic conditions in some districts did not meet the requirements of this crop, which necessitated changes in regional varietal distribution. Acreages under sunflower were increased in those regions where ecological conditions better conformed to the needs of the crop, while in regions with adverse conditions sunflower production decreased.

In 1970 the acreage under sunflower increased 50-100% over the 1960 level in 8 favourable regions, and in 4 regions sunflower production ceased. In 1971-1974 sunflower was grown in 23 districts.

Sunflower production in the country was distributed as follows: in Northern Bulgaria, 78.69% and 82.92% of acreage and output respectively, in Southern Bulgaria, 21.3% and 17.08% respectively. During the period of studies the mean annual production of seed in 10 districts amounted

to 10,000 tons in 2 districts from 10,000 to 20,000 tons, in 6 regions from 20,000 to 30,000 tons, and in 5 districts over 30,000 tons. Studies conducted in districts and complex economic regions have shown that it is economically expedient to cease cultivating sunflower in additional 7 districts where other crops are more effective.

A high rate of production concentration promotes a rapid growth of labour productivity creating conditions for a wider introduction and fuller utilization of highly productive equipment and aviation and for a further increase of production effectiveness. Results of analyses conducted on co-operative farms of Tolbukhin district in 1970-1972 have shown the following relationship. Farms with a mean annual output of up to 1500 tons showed the mean yield of 20.3 c/ha; farms producing over 2500 tons showed 22.8 q/ha and reduced the cost of the products by 20.3% as compared to the first group.

The requirement for the future is that any district that has to grow sunflower must produce at least 10,000 tons. According to the concentration plan sunflower production in 1976-1980 will be concentrated in 16 districts; 4 of which will produce 10,000-20,000 tons, 3 will produce 20,000-30,000 tons and 9 over 30,000 tons.

Along with the higher production concentration provision is made for an increase of acreages under sunflower. In 1970 a sunflower production unit was 60 ha on average in 1972 - 82.3 ha, and in 1980 it will be 300-500 ha.

Territorial distribution of the processing facilities is also brought in conformity with district division and production concentration. In 1971-1975 new modern sunflower processing plants were built.

The second trend of production, growth and improvement lies in introducing effective managerial practices allowing more effective utilization of the genetical potential of varieties and hybrids for their productivity.

The mean yield level obtained experimentally by the principal variety grown in the country, Peredovik is 33-35 c/ha and some hybrids show 40-45 c/ha on unirrigated land. Under production conditions the mean annual yield is 17-19 c/ha, which means that about 50% of the genetical potential is utilized. In the most favourable regions such as Dobrudzha the yields range from 23 to 25 c/ha, or the coefficient amounts to 65%. Some co-operative farms regularly obtain yields of 30-32 c/ha, i. e. over 80% of yielding potential is utilized.

Results of analyses for the last 5 years show that under the conditions of our country the genetically dependent productivity level of varieties can be utilized up to 65%.

To make this possible it is of decisive importance to improve certain most important aspects of managerial practices.

At present sunflower occupies about 8% of land in the field crop rotation, or up to 14% in the most favourable regions, this index being the upper limit of a saturated crop rotation. Under our conditions the most effective crop rotation scheme from the phytosanitary and economic points of view is as follows: wheat-maize-wheat-sunflower in the same field with other plough crops.

In the future, as a result of production concentration, sunflower acreage will be further expanded in favourable regions. That is why introduction of sunflower varieties and hybrids resistant to diseases is an important step to obtain stable yields from year to year.

A wide range of soil specifics in the country makes for the diversity of rates and ratios of fertilizers, the most important being the ratio between nitrogen and phosphorus. According to research data, it is within the range of 1:0.6 to 1:1 depending on soil reserves of mobile phosphorus at the nitrogen rate of 60-140 kg/ha and 80-120 kg/ha of phosphorus.

Intensive nitrogen utilization by plants at

initial stages of development under unfavourable meteorologic conditions may result in metabolic disturbances of this element. In this case utilization of molybdenum may become necessary as it is a growth regulator which promotes the effectiveness of macro-fertilizers up to 15%. Ample potassium reserves in the soils under sunflower and low effectiveness of fertilization by this element eliminate the necessity of its utilization.

General soil managerial practices for sunflower cultivation have been essentially changed during the past 10-15 years. In the presence of perennial weeds and a low availability of fertilizers the main plowing was effected to the depth of 30-35 cm being at present 25 cm and showing tendency of further reduction.

Research data show that the generally adopted plant density of 40,000 plants/ha is insufficient. The variety Peredovik yields more at 45,000 plants/ha in the South of the country and at 55,000-57,000 plants/ha in the North.

The main measure of weed control on sunflower fields is now a mechanical cultivation after planting. As a rule two harrowings are used: the first before seedling emergence and the second at the phase of two real leaves. Observations have shown that each harrowing, if conducted in due times destroys 85-95% of weed seedlings.

Sunflower harvesting on large acreages in the country is effected by a new attachment to grain harvester combine PShS-6. In the case of full introduction of this attachment the total output of sunflower will increase by 7-8% as a result of reduction of losses during harvest. Along with grain harvesting this attachment allows the collection of the green mass after grain separation. Two methods have been developed for conservation and utilization of this green mass as feed for animal husbandry.