

EVALUATION OF THE OPTIMAL SIZE OF FARM PRODUCTION RESOURCES

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In the article the method of evaluation the optimum size of land and labor, material and money resources for farms is given. The farmers can evaluate their production capabilities in other natural-economic zones of the Republic of Bashkortostan and determine the area of land needed for the production of primary products by using of this method.

The lack of evidence-based calculations of the optimum size of production resources in the departments of Agriculture administrative districts and business plans in farms leads to unproductive use of large land areas and equipment, and irrational use of labor. Choosing the right size of the farm allows for minimal labor cost per unit of production, rational use of land and other means of production.

Calculating the size of inputs for crop production is carried out in three stages:

- ◆ at the first stage the natural productivity of the major cash crops is calculated;
- ◆ at the second stage the ratio of card technology to the traditional technology is calculated;
- ◆ at the third stage the optimal number of workers, agricultural machinery is determined.

Our aim is to define the optimal demand of productive resources for natural yields of the major cash crops in the context of natural-economic zones of the Republic of Bashkortostan in the light of the following relationships in crop yields from the evaluation of arable land.

Based on the flow charts and time-consuming cultivation of agricultural crops the rational need for labor (N_{lab}) is defined by formula (1):

$$N_{lab} = \frac{\sum_{i=1}^n T_{Pi}}{0,75T_{PN}},$$

where $\sum_{i=1}^n T_{Pi}$ is the total complexity of all operations, crops, man-hour; T_{PN} is the normative workload of an employee, taking into account seasonality, hours.

Based on the total complexity of operations, crop management and regulatory workload of an employee during the working period, the area of arable land in farms which workers can handle were calculated.

The necessary equipment (N_{TEH}) is determined by the formula (2):

$$N_{TEH} = \frac{N_{potr}}{1000 \cdot k_3} \cdot S_f,$$

where N_{potr} is the regulatory demand for equipment in the reference units for the Volga Federal District, zone 4.2 - The Republic of Bashkortostan; k_3 is the conversion factor to the reference unit standard requirements in engineering; S_f is the actual area of arable land; 1000 is the constant coefficient.

The results show that:

- ◆ in areas smaller than 51 hectares the purchase of a tractor, even a low power one does not justify itself, since this area requires less than 0.5 units of technology;
- ◆ for the full load of combine harvesters harvesting crops the area should be not less than 120 hectares;
- ◆ full load of beet Technology BM-6B, KC-6B is possible with areas over 20 hectares;
- ◆ the use of one-row potato technology is appropriate for areas of more than 10 hectares.

We calculated the size of material and funds required for crop production as the sum of direct costs and other expenses on technology.

Money resources for the cultivation of winter rye range from 6,053.4 rubles / ha to 6,121.1 rubles / ha depending on the zone, for the cultivation of spring wheat - from 5476.1 rubles / ha to 5,509.4 rubles / ha, for barley - from

* Gamir A. Habirov, Doctor of Economic Science, Professor of Baskir State Agrarian University; Lilia A. Shildt, post-graduate student of Baskir State Agrarian University. E-mail: bgau@ufanet.ru.

4389.9 rubles / ha to 4,505.8 rubles / ha, for the cultivation of buckwheat - from 4233.8 rubles / ha to 4,316.5 rubles / ha, for the cultivation of peas - from 5864.0 rubles / ha to 5,951.6 rubles / ha, for the cultivation of sugar beet - from 6883.3 rubles / ha to 7,526.4 rubles / ha, for the cultivation of potatoes - from 33853.2 rubles / ha to 33918.9 rubles / ha.

The effectiveness of the farm is largely determined by the optimal size of its land, which is calculated according to formula (3):

$$S_{OPT} = \sum_{i=1}^n \frac{\Pi_f}{S_{cond}}$$

where S_{cond} is the need for the area to produce 1 hundredweight products, ha; Π_f is the need to feed in natural terms, hundredweight; n is the type of food.

The calculations given above allow farmers to assess their manufacturing capabilities in the light of natural-economic zones of the region under study and form the area of land needed for the production of consumer staples.

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