DETERMINATION PRINCIPLES OF POWER INTENSITY OF AGRICULTURAL PRODUCES

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Abstract: In the primary production and process of every agricultural produce, it is consumed a volume of power resources. By the notion of power intensity of agricultural produces, it is understood the quantity of the minimum necessary energy for the production of an unity of agricultural produce.

Key words: power intensity, agricultural produce, volume of energy.

1. INTRODUCTION

In the primary production and processing process of agricultural produces it is consumed a volume of power resources of different forms (petrol, Diesel oil, lubricating materials, electrical energy, etc.). Depending on the building where the produce is produced and the production technology of the respective agricultural produce, it is consumed different weight in the cost formation of the respective produce. As a result of this phenomenon, one and the same agricultural produce, produced in different countries that possess diverse production technologies, diverse power intensities and therefore the cost price and the sale price are diverse. From the described things it results that the power intensity of agricultural produces has a direct influence over the sale market and over the identical agricultural produce competition.

2. PROBLEM DEVELOPMENT

In order to determine the power intensity at the agricultural produce production it is necessary that the power resources consumption (whatever its type) and the place of this produce production to be compared and determined in a ratio of an agricultural produce entity. This phenomenon can be made best when all spent power resources turn into conventional fuel and the power intensity is determined in a ratio of conventional fuel.

3. EQUIVALENT TRANSITION OF DIFFERENT FUEL TYPES INTO CONVENTIONAL FUEL

In order to accomplish the power energy determination at the production and primary processing of agricultural produces according to [1,3], appears the necessity of accomplishment of the equivalent transition of different fuel types into conventional fuel, which gives the possibility to operate with ones and the same notions and power quantities regardless of the used fuel type.

According to [1, 3], in order to accomplish the equivalent transition of different fuel types into conventional fuel it is used the following rates, which are presented in the table 1.

Table 1. Determination of equivalent transition rates from different fuel types into conventional fuel

Nr.	Fuel name	Measure unit, litre.	Quantity	
			Units, kg	Type
1	Petrol	1, litre	1.500	conv. fuel
2	Diesel oil	1, litre	1.450	conv. fuel
3	Lubricating materials	1, litre	1.438	conv. fuel
4	Liquefied natural gases	1, litre	1.242	conv. fuel
5	Fossil materials	1, m^3	670-940	conv. fuel
6	Electrical energy	1, kWh	0.328– 0.352	conv. fuel

Technological proceedings for vine planting and cultivation for the first technological year are presented in the table 2.

Table 2. Types of used technologies for vine planting and cultivation

Nr	Technology name	Measure unit, litre/hectare.	Quantity	
			Unit, kg	Total , kg. conv. fuel
1	Ploughing the soil for planting	42	1.450	60.9
2	Harrowing	18	1.450	26.1
3	Planting	24	1,450	34.8
4	Cultivating	4x16	1.450	92.8
5	Sulphuring	3x16	1.450	69.6
6	Lubricants	8	1.438	11.5
7	Power resources (petrol)	32	1,500	48.0
	Total power resources	**-**	**-**	**343.7**

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Technological proceedings for vine attendance in the second technological year are presented in the table 3.

Table 3. Types of used technologies for vine cultivation and growing

Nr	Technology name	Measure unit, litre/hectare	Quantity	
			Units, kg	Total ,kg. conv. fuel
1	Cultivation	4x16	1.450	92.8
2	Sulphuring	3x16	1.450	69.6
3	Lubricants	8	1.438	11.5
4	Power resources (petrol)	32	1.500	48.0
5	Total power resources	-	-	221.9

Technological proceedings for vine attendance in the third technological year are presented in the table 4.

Table 4. Types of used technologies for vine cultivation and growing

Nr	Technology name	Measure unit, litre/hectare.	Quantity	
			Units, kg	Total kg. conv. fuel
1	Cultivation	4x16	1.450	92.8
2	Sulphuring	3x16	1.450	69.6
3	Lubricants	8	1.438	11.5
4	Power resources (petrol)	32	1.500	48.0
5	The first fruits gathering	3x16	1.450	69.6
6	Total power resources	-	-	291.5

The succinct consumption of power resources for the accomplishment of growing and attendance technologies of a vine hectare, taking into consideration the whole respective demands for the first three years, are presented in the table 5.

Table 5. Types of used technologies for vine cultivation and growing

Nr	Growing year	Consumption volume of power resources, kg. conv. fuel	
		Units,	Total, kg. Conv. fuel
1	The first year of vine attendance	kg. conv. fuel	343.7
2	The 2 (second) year of vine attendance	kg. conv. fuel	221.9
3	The 3 (third) year of vine attendance	kg. conv. fuel	291.5
4	Total consumption of power resources	kg. conv. fuel	857.1

The obtained results are verified with those statistics, experimental and compared with theoretical materials [2,6], which practically commit an error not bigger than 5 %, so $\Delta<5\%$.

CONCLUSIONS

From the analysis of the statistical materials (from different zones of the Republic of Moldova where the vine is cultivated) and technical ones, it was reasoned and determined the expenses in power resources for vine planting and processing according to the present technological demands for each technological year till the first fruit.

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