

Anna Usenok, Andrey Tsymbal

BFFSA, Russia

Bioenergy - an independent branch of a great power, it occupies a prominent place in world production of heat, electricity and biofuels. The leading countries of the world pay much attention to renewable energy sources (RES), derived from plant material, including biodiesel. The use of renewable energy also corresponds to the modern Russia's energy strategy.

A. Biodiesel - a methyl ester, obtained by chemical reaction of vegetable oils and animal fats, in particular from rapeseed.

Biodiesel has good lubricity than favorably with diesel fuel. It prolongs the life of the engine, removing deposits of oil in its detail. In addition, biofuels are significantly cleaner than diesel: emissions of carbon black is less than 50% of CO (carbon monoxide) - by 10-12%, CH (hydrocarbon) - 20%, the content of SO₂ (sulfur dioxide) in the exhaust - 0.005-0.05 % vs. 0.2-0.5% for diesel fuel. Due to the high oxygen content in biodiesel (10%) in the exhaust gases of a car more nitrogen oxides. But this figure is reduced to normal in the right mood of the fuel system.

That is why it is important to evaluate the potential of rapeseed based employment area, yield and quality of rapeseed oil produced in the production of biodiesel.

B. The prospect of using rapeseed as a biofuel. The Kaliningrad region (estimated at the Ministry of Agriculture) is positioned as the region is actively sow rapeseed. The highest yield was 33.4 t / ha. Favorable economic conditions makes it possible to supply a raw material for production of biofuels and biofuel ready to European countries that are major consumers of biodiesel and biobutanol.

Rapeseed is grown in all 13 districts of the region an area of 34.9 ha (2010).

Biodiesel production in the Kaliningrad region (in 2011) is about 32.5 tons / year - 1200.5 TJ / year. In 2011, SO₂ emissions in 1261 decreased to r, CO - 79.3 thousand tons.

The number of diesel fuel consumed annually is increasing (in 2010 - 183.7 thousand tons). Thus it is possible to improve the power supply area and the ecological situation in the region. Total emissions of pollutants from motor vehicles in 2010 amounted to 119.34 thousand tons, of which use diesel fuel -10.88 tons (10%).

In the emissions from the combustion of biodiesel is practically no sulfur, so they are equal to zero. When accounting for CO₂ emissions from renewable fuels are zero, because unlike fossil fuels, the combustion of biodiesel does not increase the percentage of CO₂ in the atmosphere. Reducing CO₂ emissions by using biodiesel in the Kaliningrad region is 62.0 tons / year (Table 1).

Table 1 – Reducing emissions of CO₂ and SO₂ in the use of biodiesel in the Kaliningrad region in 2010.

The number of biodiesel fuel, thousands of tons	Sown area of thousands of hectares	The potential energy of the biodiesel TJ (T = =1012)	The equivalent of diesel fuel, thousands of tons	Emissions from biodiesel, thousands of tons		Emissions from diesel fuel, thousands of tons		Reducing emissions of thousands of tons / year	
				CO ₂	SO ₂	CO ₂	SO ₂	CO ₂	SO ₂
32,5	34,9	1293,5	30,5	30	0	92,0	0,122	62,0	0,122

In line with the target program "The main directions of development of agriculture of the Kaliningrad region for 2007-2016." potentially possible area under rapeseed may be 107.5 thousand hectares. This means that bio-energy potential of the region will increase significantly. If the yield of rapeseed in 2016 to take about 30 kg / ha, the yield of biodiesel is equal to 94.8 tons.

C. The negative effects. The technology allows for rapeseed 2-3-one-time processing of crops with pesticides by aircraft during the flowering plants. While rapeseed is pollinated by insects, honeybees, which are destroyed in large numbers. And as the wind carries pesticides on crops adjacent to the rapeseed area of human settlements, water and pastures. They fall in food animals, the human body, along with milk, meat, vegetables and water.

Nowadays sown oilseed rapeseed is given a quarter of agricultural land.

Due to the increasing demand for biodiesel requires more acreage for rapeseed, therefore, deforestation, land use of food crops. This situation could have unpredictable consequences, and threatens food and environmental security of the planet.

Only an integrated, scientific approach to the problem can bring results. Otherwise we will have and the food, and environmental and energy crisis.

D. Economic effect.

Return to the Kaliningrad region of rapeseed in 2011 ranked third. At the same time, the profitability of oilseed rapeseed was much higher in comparison with the grain, and was - 25.9%, respectively. In 2009, the margin was 23.8%.

At the same time dependence of the value of biodiesel and diesel: biodiesel B100 – 600 € per ton., diesel - 775€. The benefits of biofuels: to reduce emissions, improved fuel lubricity, the ability of the natural decomposition when pouring fuel.

Using the potential of biodiesel can improve not only the energy security of the region, but also its ecological environment, as biodiesel can be used for automotive vehicles, in taxis and public transport, the Kaliningrad region.