

Title: **Rapeseed oil as alternative fuel in the agriculture**

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Abstract

In recent years many companies were founded offering adaptation systems, which enable using pure vegetable oil as fuel in series of on the market available engines. Generally there are one- and two-tank-systems for differing adaptation systems. One-tank-system tractors are only driven with vegetable oil in difference to two-tank-system tractors which are driven with both – vegetable fuel and diesel. Conventional fuel -diesel- is used during starting and shutting the motor off as well as during adversarial operating conditions. Regarding the proposition of adaptation systems there is no acceptance on the part of industry.

In the context of this project “rapeseed oil tractors” which has been running from October 2003 to May 2008 the practical suitability will be investigated.

Therefore a fleet test with 35 tractors will be conducted and scientifically advised as well as documented during the project term. For analysing tractors, investigations of power output and emissions are made at the beginning and the end of project term. Additionally engine oil is tested every 50 operating hours as well as samples of rapeseed oil from the oil mills, the storages and the tractor fuel tanks are analyzed regularly.

Up to date 33 tractors and one irrigation engine were adapted within the project. In this connection eighteen one-tank-systems as well as sixteen two-tank-systems are used. Until now -September 2006- the tractors used about 300.000 litre of vegetable oil which complies with 27.500 hours of operation.

The power curve regarding vegetable fuel do not considerably change from that of diesel, only a small increased consumption is established. The averaged analysed values of carbonic oxide gas and hydrocarbon of vegetable fuel are lower than those of diesel. Differently to the nitrogen oxide – in that case there are higher emissions when operated with vegetable fuel.

Generally the analysed results concerning samples of engine oil are absolutely due to the average. Changing intervals which are advised by the producer could be complied. Varieties are given watching the adaptation systems – in one-tank-systems samples of engine oil are showing generally a higher concentration of soot and rapeseed oil.

Rapeseed oil is used as fuel in the fleet test oil which should comply with legal requirements in the Austrian fuel regulation. The majority of cases exceeding limit values consist concerning contamination, although the values decreased during the project and now determine in average below 25mg/kg which is the limit value. The acid value as well as the phosphorus content is within the limit.

On principle operation of “rapeseed oil tractors” is satisfying, but it is too early to give final results. Final statements about the acceptability of the adaptation systems are given at the end of the project term when the engines are opened and exactly analysed.