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Development of bio-lubricants from non-food crops for use in agricultural machinery

Carlo Bisaglia[1], Angela Sagliano[2], Luigi Capuzzi[2], Daniele Pochi[1], Roberto Fanigliulo[1], Massimo Brambilla[1], Maurizio Cutini[1] and **Fulvio Palmieri[3]**

[1]Ingegneria e Trasformazioni Agroalimentari- CREA, Italy
[2]Novamont S.p.A., Italy
[3]Università Roma Tre, Italy

Agricultural types of machineries are very specialized tools devoted to a huge range of applications. Most of these applications are executed in the natural environment such as open fields, forestry, water systems for irrigation, livestock, orchards, etc. Quite always this machinery foresees tractors coupled with different equipment that is mechanically, electrically or hydraulically driven by the tractor. In this last case also in the event of self-propelled agricultural machinery is generally provided with hydraulic transmission – some oil (lubricant, grease or hydraulic fluid) could drips off the fittings and gaskets and reach the environment (soil, water, crops, feed, etc.). A survey was carried out at some contractors in North-West Italy showed that if the tractors are not provided with collectors, the oil leaks could reach 2 L year-1 per unit. With this background in mind, a research project involving private industry and public research institutions has deeply investigated the possibility to obtain lubricants from non-food crops and test them in lab and field scale purpose designed test benches. Two main products of considerable use in agricultural machinery have been designed industrially realized in different formulations and tested for universal tractor transmission oils (UTTO) and hydraulic fluids. The first are used as lubricant, heat sink and power supplier in tractors; the second are specialized for power supplier in medium-high engine power tractors with a separate reservoir from the transmission box. The paper presents a description of the project of the designed test benches and the first results achieved.

carlo.bisaglia@crea.gov.it