

# **Alternative Energy Crops for Agricultural Machinery Biofuels – Focus on Biodiesel**

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## **ABSTRACT**

This century could see a significant switch from a fossil fuel to a bioenergy-based economy, with agriculture and forestry as the leading sources of biomass for biofuels such as fuelwood, charcoal, wood pellets, bioethanol, biodiesel and bioelectricity.

Liquid biofuels in general, and biodiesel, in particular, have gained importance in the last years in more than 21 countries leading to commercial projects in Austria, the Czech Republic, France, Germany, Italy, Malaysia, Nicaragua, Sweden and the USA. The most common end use is the transport sector, including agricultural machinery. At the same time, the role of agriculture as a source of energy resources is gaining in importance. Scenarios developed for the USA and the EU indicate that short-term targets of up to a 13 percent displacement of petroleum-based fuels with liquid biofuels (bioethanol and biodiesel) appear feasible on available cropland. More ambitious targets will have to be fulfilled with imports. As a carbon-neutral source of energy, biofuels can also contribute to climate change mitigation through substituting fossil fuels, when sustainably produced.

The utilization of untapped residues and the establishment of energy crops can address other existing environmental concerns. Annual energy crops can allow diversification and expansion of crop rotations, with benefits in terms of water, soil and inputs management. Deforested, degraded and marginal land could be rehabilitated as bioenergy plantations which could combat desertification and increase food production. It is important to avoid possible negative environmental impacts associated with loss of biodiversity, organic depletion in soils and possible negative energy or Carbon balances.

Increasing the use of biodiesel could also lead to improved economic development and poverty alleviation, especially in rural areas, since it attracts investment in new jobs and business opportunities for small- and medium-sized enterprises in the fields of production, preparation, transportation, trade and use.

Biodiesel can be made from oils extracted from rapeseed, sunflower, soybean, palmoil, linseed, canola, castor, jatropha, hemp, beef tallow and even algae or from used frying oil. The selection of the original biomass is guided by environmental, economic and technical issues.

Bioenergy systems can be relatively complex, interdisciplinary, intersectoral and site- specific. Therefore, it is necessary to promote integrated and synergic policies and approaches in the sectors of agriculture, energy, industry and environment.

The presentation will highlight some of the key technical, environmental and economic issues guiding and controlling the selection of a particular energy crop for biodiesel production.

See also PowerPoint slide presentation, Invited Overview number 14, Vol. VIII.