

Biomass production on marginal lands – catalogue of bioenergy crops

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Marginal lands are the poorest type of land, with various limitations for traditional agriculture. However, they can be used for biomass production for bioenergy based on perennial plants or trees. The main advantage of biomass as an energy source compared to fossil fuels is the positive influence on the global carbon dioxide balance in the atmosphere. During combustion of biofuels, less carbon dioxide is emitted than is absorbed by plants during photosynthesis. Besides, 20 to 30 times less sulphur oxide and 3 to 4 times less ash is formed as compared with coal. Growing bioenergy crops creates additional workplaces in rural areas.

Soil and climatic conditions of most European regions are suitable for growing perennial energy crops that are capable of rapid transforming solar energy into energy-intensive biomass. Selected plants are not demanding for soil fertility, do not require a significant amount of fertilizers and pesticides and can be cultivated, therefore, also on unproductive lands of Europe. They prevent soil erosion, contribute to the preservation and improvement of agroecosystems and provide low-cost biomass. A catalogue of potential bioenergy plants was developed within the EU H2020 project SEEMLA including woody and perennial crops that are allowed to be grown in the territory of the EU and Ukraine. The catalogue lists high-productive woody and perennial crops that are not demanding to the conditions of growing and can guarantee stable high yields of high-energy-capacity biomass on marginal lands of various categories of marginality.

Biomass of perennial plants and trees is composed of cellulose, hemicellulose and lignin, which are directly used to produce solid biofuels. Thanks to the well-developed root system of trees and perennial plants, they are better adapted to poor soils and do not require careful maintenance. Therefore, they can be grown on marginal lands. Particular C4 bioenergy crops are well adapted to a lack of moisture and high temperature and can be grown also in arid and semiarid regions of Europe.