

Semi-Natural Meadows of Natura 2000 Habitats - Conservation and Renewable Energy Source

Authors : Mateusz Meserszmit, Mariusz Chrabąszcz, Adriana Trojanowska-Olichwer, Zygmunt Kącki

Abstract : Semi-natural meadows are valuable communities from the point of view of biodiversity, but their survival is strongly related to human activity. Unfortunately, the current status of preservation of extensively used meadows in Europe is frequently assessed as “unfavorable”. This is due to agricultural activity, in particular the lack of appropriate conservation procedures such as the cutting of meadows or livestock grazing. However, for more effective protective measures, the preservation of the biological diversity of meadows requires an interdisciplinary approach from both scientists and practitioners from many fields. Our research aimed to present the possibility of conservation of semi-natural meadows using cut biomass for the production of bioenergy - biogas, taking into consideration the botanical characteristics of the studied habitat and the chemical properties of biomass. A field study was conducted in Poland, within an area covered by the European Union's nature conservation programme. The samples were collected on four dates (May 24th, July 1st, July 23rd, and September 1st) from a study site established within a Molinion meadow. The biomass collected at the earliest date mostly consisted of plants with flowers in bud or fully open flowers. At the later harvest dates, most plants were at the fruiting or seed shed stage. An earlier stage of plant growth contributed to a lower biomass yield, which also resulted in a lower methane yield per hectare. The methane yield per hectare was at the end of May 482 m³ CH₄ ha⁻¹, at the beginning of July 867 m³ CH₄ ha⁻¹, at the end of July 759 m³ CH₄ ha⁻¹ and at the beginning of September 730 m³ CH₄ ha⁻¹. The biomass harvested in May demonstrated a significantly higher content of the elements: N, P, and K, but a lower Ca content compared to later harvested biomass, which may affect the biogas production process. The use of hay as a source of renewable energy can become an important element of conservation adapted for this type of habitat.

Keywords : nature conservation, biomass, bioenergy, grassland

Conference Title : ICEB 2020 : International Conference on Ecosystems and Biodiversity

Conference Location : Singapore, Singapore

Conference Dates : November 19-20, 2020