De Pace C., S. Del Puglia, R. Ruggeri, D. Vittori, and F. Rossini**, 2010**. New clones of Helianthus tuberosus enlarge options for the sustainable integration of bioenergy crops in current farming systems of central Italy. In: Poc.18th European Biomass Conference: From Research to Industry and Markets (L. Spitzer, J. F. Dallemand, D. Baxter, H. Ossenbrink, A. Grassi, P. Helm, eds.). Lyon, France, 3-7 May 2010, FLORENCE: ETA-Florence Renewable Energies, [p. 214-219](http://www.etaflorence.it/proceedings/?detail=5946&searchstring=De%20Pace). DOI:10.5071/18thEUBCE2010-OD4.5; **ISBN/ISSN: 978-88-89407-56-5**. [**Abstract**](http://www.etaflorence.it/proceedings/?detail=5946&searchstring=De%20Pace)

ABSTRACT: The inclusion of energy crops in farming systems is an opportunity for growers to increase the efficiency of agricultural inputs and reduce emissions of potential greenhouse gases, while maintaining profitability and soil ferility. Among the few species eligible for this purpose, *H. tuberosus* L. (*Ht*) may become an alternative to dismissed maize or sugar beet or grape cropping systems. The efficiency of *Ht* stalk and tuber biomass production depends, among other factors, on plant density and water resources supply. *Ht* clones expressing new structure for plant architecture and phenological phases were selected to explore a range of farm production environments in Central Italy, differing mainly for the air temperature and rainfall patterns. A pilot-study was developed for preparing a *Ht*-cropping system for carbohydrate-rich biomass production in rainfed conditions or in farms equipped with emergence irrigation facilities. We have identified two *Ht* clones which are expected that, under a larger experimental field test, will be suitable for high stalk-biomass and high tuber-biomass production. It is also expected that the two clones will be a proper alternative to sugar beet for the sustainable production of biomass to be converted in liquid biofuels.

**Keywords**: bioenergy, cropping systems, climatic conditions, *Helianthus tuberosus*, sustainability.